GARMIN

G500/600

Pilot's Guide

© 2015 Garmin Ltd. or its subsidiaries. All rights reserved.

This manual reflects the operation of System Software version 7.00, or later. Some differences in operation may be observed when comparing the information in this manual to later software versions.

Garmin International, Inc., 1200 East 151st Street, Olathe, KS 66062, U.S.A.
Tel: 913/397.8200 Fax: 913/397.8282

Garmin AT, Inc., 2345 Turner Road SE, Salem, OR 97302, U.S.A.
Tel: 503/391.3411 Fax 503/364.2138

Garmin (Europe) Ltd., Liberty House, Bulls Copse Road, Hounsdown Business Park, Southampton,
SO40 9RB, U.K.
Tel. +44 (0) 870 850 1243 Fax +44 (0) 238 052 4004

Garmin Singapore Pte. Ltd., 46 East Coast Road, #05-06 Eastgate, Singapore 428766
Tel : (65) 63480378 Fax : (65) 63480278

At Garmin, we value your opinion. For comments about this guide, please e-mail:
Techpubs.Salem@Garmin.com

www.garmin.com

Except as expressly provided herein, no part of this manual may be reproduced, copied, transmitted, disseminated, downloaded or stored in any storage medium, for any purpose without the express written permission of Garmin. Garmin hereby grants permission to download a single copy of this manual and of any revision to this manual onto a hard drive or other electronic storage medium to be viewed for personal use, provided that such electronic or printed copy of this manual or revision must contain the complete text of this copyright notice and provided further that any unauthorized commercial distribution of this manual or any revision hereto is strictly prohibited.

Garmin®, FliteCharts®, and SafeTaxi® are registered trademarks of Garmin Ltd. or its subsidiaries. SVT™, G500™, and G600™ are trademarks of Garmin Ltd. or its subsidiaries. These trademarks may not be used without the express permission of Garmin.

NavData® is a registered trademark of Jeppesen, Inc.; SkyWatch® is a registered trademark of L-3 Avionics Systems; Sirius and XM are trademarks of Sirius XM Radio Inc.; Iridium® is a registered trademark of Iridium Communications Inc.; Canadian radar data provided by Environment Canada; United States radar data provided by NOAA; European radar data collected and provided by Meteo France.

March 2015 Printed in the U.S.A.

AVIATION LIMITED WARRANTY

All Garmin avionics products are warranted to be free from defects in materials or workmanship for: two years from the date of purchase for new Remote-Mount and Panel-Mount products; one year from the date of purchase for new portable products and any purchased newly-overhauled products; six months for newly-overhauled products exchanged through a Garmin Authorized Service Center; and 90 days for factory repaired or newly-overhauled products exchanged at Garmin in lieu of repair. Within the applicable period, Garmin will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not apply to: (i) cosmetic damage, such as scratches, nicks and dents; (ii) consumable parts, such as batteries, unless product damage has occurred due to a defect in materials or workmanship; (iii) damage caused by accident, abuse, misuse, water, flood, fire, or other acts of nature or external causes; (iv) damage caused by service performed by anyone who is not an authorized service provider of Garmin; or (v) damage to a product that has been modified or altered without the written permission of Garmin. In addition, Garmin reserves the right to refuse warranty claims against products or services that are obtained and/or used in contravention of the laws of any country.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Garmin retains the exclusive right to repair or replace (with a new or newly-overhauled replacement product) the product or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

Online Auction Purchases: Products purchased through online auctions are not eligible for warranty coverage. Online auction confirmations are not accepted for warranty verification. To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. Garmin will not replace missing components from any package purchased through an online auction.

International Purchases: A separate warranty may be provided by international distributors for devices purchased outside the United States depending on the country. If applicable, this warranty is provided by the local in-country distributor and this distributor provides local service for your device. Distributor warranties are only valid in the area of intended distribution. Devices purchased in the United States or Canada must be returned to the Garmin service center in the United Kingdom, the United States, Canada, or Taiwan for service.

To obtain warranty service, contact your local Garmin Authorized Service Center. For assistance in locating a Service Center near you, visit the Garmin web site at http://www.garmin.com or contact Garmin Customer Service at 866-739-5687.

WARNING: *Navigation and terrain separation must NOT be predicated upon the use of the terrain function. The GDU 620 Terrain Proximity feature is NOT intended to be used as a primary reference for terrain avoidance and does not relieve the pilot from the responsibility of being aware of surroundings during flight. The Terrain Proximity feature is only to be used as an aid for terrain avoidance and is not certified for use in applications requiring a certified terrain awareness system. Terrain (TAWS) data is obtained from third party sources. Garmin is not able to independently verify the accuracy of the terrain data.*

WARNING: *The displayed minimum safe altitudes (MSAs) are only advisory in nature and should not be relied upon as the sole source of obstacle and terrain avoidance information. Always refer to current aeronautical charts for appropriate minimum clearance altitudes.*

WARNING: *The Garmin GDU 620 has a very high degree of functional integrity. However, the pilot must recognize that providing monitoring and/or self-test capability for all conceivable system failures is not practical. Although unlikely, it may be possible for erroneous operation to occur without a fault indication shown by the GDU 620. It is thus the responsibility of the pilot to detect such an occurrence by means of cross-checking with all redundant or correlated information available in the cockpit.*

WARNING: *The altitude calculated by GPS receivers is geometric height above Mean Sea Level and could vary significantly from the altitude displayed by pressure altimeters, such as the output from the GDC 74A/74B Air Data Computer, or other altimeters in aircraft. GPS altitude should never be used for vertical navigation. Always use pressure altitude displayed by the GDU 620 PFD or other pressure altimeters in aircraft.*

WARNING: *Do not use outdated database information. Databases used in the G500/600 systems must be updated regularly in order to ensure that the information remains current. Pilots using an outdated database do so entirely at their own risk.*

WARNING: *Do not use basemap (land and water data) information for primary navigation. Basemap data is intended only to supplement other approved navigation data sources and should be considered as an aid to enhance situational awareness.*

WARNING: *Traffic information shown on the GDU 620 Multi Function Display is provided as an aid in visually acquiring traffic. Pilots must maneuver the aircraft based only upon ATC guidance or positive visual acquisition of conflicting traffic.*

WARNING: *Do not use data link weather information for maneuvering in, near, or around areas of hazardous weather. Information contained within data link weather products may not accurately depict current weather conditions.*

WARNING: *Do not use the indicated data link weather product age to determine the age of the weather information shown by the data link weather product. Due to time delays inherent in gathering and processing weather data for data link transmission, the weather information shown by the data link weather product may be significantly older than the indicated weather product age.*

WARNING: *For safety reasons, GDU 620 operational procedures must be learned on the ground.*

WARNING: *To reduce the risk of unsafe operation, carefully review and understand all aspects of the G500/600 Pilot's Guide. Thoroughly practice basic operation prior to actual use. During flight operations, carefully compare indications from the GDU 620 to all available navigation sources, including the information from other NAVAIDs, visual sightings, charts, etc. For safety purposes, always resolve any discrepancies before continuing navigation.*

WARNING: *Exceeding 200 deg/second in pitch or roll may invalidate AHRS attitude provided to the GDU 620. Exceeding 450 KIAS may invalidate ADC information provided to the GDU 620.*

WARNING: *Because of anomalies in the earth's magnetic field, operating the G500/600 within the following areas could result in loss of reliable attitude and heading indications. North of 70° North latitude and south of 70° South latitude. An area north of 65° North latitude and between longitude 75° West and 120° West. An area north of 70° North latitude and between longitude 70° West and 128° West. An area north of 70° North latitude and between longitude 85° East and 114° West. An area south of 55° South latitude between longitude 120° East and 165° East.*

WARNING: *Do not use Terrain-SVT information for primary terrain avoidance. Terrain-SVT is intended only to enhance situational awareness.*

CAUTION: *The United States government operates the Global Positioning System and is solely responsible for its accuracy and maintenance. The GPS system is subject to changes which could affect the accuracy and performance of all GPS equipment. Portions of the Garmin GDU 620 utilize GPS as a precision electronic NAVigation AID (NAVAID). Therefore, as with all NAVAIDs, information presented by the GDU 620 can be misused or misinterpreted and, therefore, become unsafe.*

CAUTION: *The Garmin GDU 620 does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could void both the warranty and the pilot's authority to operate this device under FAA/FCC regulations.*

CAUTION: *The GDU 620 PFD and MFD displays use a lens coated with a special anti-reflective coating that is very sensitive to skin oils, waxes, and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the lens using a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective coatings.*

CAUTION: *FIS-B information is to be used for pilot planning decisions and pilot near-term decisions focused on avoiding areas of inclement weather that are beyond visual range or where poor visibility precludes visual acquisition of inclement weather. FIS-B weather and NAS status information may be used as follows:*
- To promote pilot awareness of own ship location with respect to reported weather, including hazardous meteorological conditions, NAS status indicators, and enhance pilot planning decisions and pilot near-term decision-making.
- To cue the pilot to communicate with the Air Traffic Control controller, Flight Service Station specialist, operator dispatch, or airline operations control center for general and mission critical meteorological information, NAS status conditions, or both.

FIS-B information, including, weather information, NOTAMs, and TFR areas, are intended for the sole purpose of assisting in long- and near-term planning decision making. The system lacks sufficient resolution and updating capability necessary for aerial maneuvering associated with immediate decisions.

***NOTE**: Do not rely solely upon data link services to provide Temporary Flight Restriction (TFR) information. Always confirm TFR information through official sources such as Flight Service Stations or Air Traffic Control.*

***NOTE**: Interference from GPS repeaters operating inside nearby hangars can cause an intermittent loss of attitude and heading displays while the aircraft is on the ground. Moving the aircraft more than 100 feet away from the source of the interference should alleviate the condition.*

***NOTE**: All visual depictions contained within this document, including screen images of the GDU 620 bezel and displays, are subject to change and may not reflect the most current GDU 620 system. Depictions of equipment may differ slightly from the actual equipment.*

***NOTE**: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

***NOTE**: This product, its packaging, and its components contain chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. This notice is being provided in accordance with California's Proposition 65. If you have any questions or would like additional information, please refer to our web site at www.garmin.com/prop65.*

***NOTE**: Terrain-SVT is standard when the Synthetic Vision Technology™ (SVT) option is installed. The TAWS option will take precedence over Terrain-SVT.*

***NOTE:** Do not use SafeTaxi or Chartview functions as the basis for ground maneuvering. SafeTaxi and Chartview functions have not been qualified to be used as an airport moving map display (AMMD). SafeTaxi and Chartview are intended to improve pilot situational awareness during ground operations should only be used by the flight crew to orient themselves on the airport surface.*

Record of Revisions

Part Number	Revision	Date	Description
190-00601-02	A	6/10/08	Production release
	B	7/8/08	Update information
	C	4/15/09	Revision reflects functionality added with SW version 3.0. Added SVT™, TAWS-B, Terrain Proximity, Wind Vectors, Minimums Bug, GAD 43, and Weather Radar.
	D	11/19/10	Updates for SW Versions 4.00 and 5.00
	E	08/05/11	Updates for SW Version 6.00
	F	10/19/12	Updates for SW Version 6.11
	G	2/3/15	Updates for SW Version 7.00
	H	3/27/15	Chart section updated.

AOPA Airport Directory

AOPA MEMBERSHIP PUBLICATIONS, INC. AND ITS RELATED ORGANIZATIONS (HEREINAFTER COLLECTIVELY "AOPA") EXPRESSLY DISCLAIM ALL WARRANTIES, WITH RESPECT TO THE AOPA INFORMATION INCLUDED IN THIS DATA, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE INFORMATION IS PROVIDED "AS IS" AND AOPA DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING ITS ACCURACY, RELIABILITY, OR OTHERWISE. UNDER NO CIRCUMSTANCES INCLUDING NEGLIGENCE, SHALL AOPA BE LIABLE FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES THAT RESULT FROM THE USE OR INABILITY TO USE THE SOFTWARE OR RELATED DOCUMENTATION, EVEN IF AOPA OR AN AOPA AUTHORIZED REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. USER AGREES NOT TO SUE AOPA AND, TO THE MAXIMUM EXTENT ALLOWED BY LAW, TO RELEASE AND HOLD HARMLESS AOPA FROM ANY CAUSES OF ACTION, CLAIMS OR LOSSES RELATED TO ANY ACTUAL OR ALLEGED INACCURACIES IN THE INFORMATION. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OR EXCLUSION OF IMPLIED WARRANTIES OR LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

Contents

1 System Overview ... 1-1
1.1 System Description ... 1-1
  1.1.1 Standard System Line Replaceable Units (LRU) ... 1-3
  1.1.1.1 GDU 620 ... 1-4
  1.1.1.2 GDC 74A/74B ... 1-5
  1.1.1.3 GRS 77 ... 1-5
  1.1.1.4 GMU 44 ... 1-8
  1.1.1.5 GTP 59 ... 1-8
  1.1.1.6 Garmin Navigator Interface ... 1-8
  1.1.2 Optional Line Replaceable Units (LRU) ... 1-9
  1.1.2.1 GDL 88 (Optional) ... 1-9
  1.1.2.2 Weather Radar ... 1-9
  1.1.2.3 Stormscope® (Optional) ... 1-9
  1.1.2.4 GSR 56 (Optional) ... 1-9
  1.1.2.5 GDL 69/69A (Optional) ... 1-10
  1.1.2.6 GAD 43/43e (Optional) ... 1-10
  1.1.2.7 GTX 330/330D (Optional) ... 1-11
1.2 System Power Up ... 1-12
1.3 International Geomagnetic Reference Field ... 1-14
1.4 System Operation ... 1-15
  1.4.1 Pilot Controls ... 1-15
  1.4.1.1 PFD Knob ... 1-15
  1.4.1.2 PFD Bezel Keys ... 1-16
  1.4.1.3 MFD Knobs ... 1-18
  1.4.1.4 MFD Bezel Keys ... 1-18
  1.4.2 Using the Soft Key Controls ... 1-19
  1.4.3 Using the Page Menus ... 1-19
  1.4.4 System Settings ... 1-20
  1.4.5 Display Backlighting ... 1-22
2 Primary Flight Display (PFD) ... 2-1
2.1 PFD Soft Keys ... 2-2
2.2 Airspeed Indicator ... 2-5
  2.2.1 Markings ... 2-7
  2.2.2 Reference Speeds ... 2-8

2.3 Attitude Indicator 2-9
2.3.1 Extreme Attitude 2-11
2.4 Altimeter 2-13
2.4.1 Setting the Altitude Bug and Alerter 2-13
2.4.2 Altitude Alerting 2-14
2.4.3 Changing Barometric Setting 2-15
2.4.4 Minimum Descent Altitude/Decision Height Alerting 2-15
2.5 Vertical Speed (V/S) Indicator 2-18
2.6 Horizontal Situational Indicator 2-19
2.6.1 Setting the Heading Bug 2-20
2.6.2 Turn Rate Indicator 2-21
2.7 Course Deviation Indicator 2-21
2.7.1 Changing CDI Sources 2-22
2.7.2 Changing CDI Course 2-23
2.7.3 Vertical Deviation Indicator (VDI) 2-24
2.7.4 Auto-Slewing 2-25
2.8 Supplemental Flight Data 2-27
2.8.1 Bearing Pointers 2-27
2.8.2 Temperature Display 2-29
2.8.3 Wind Vectors 2-29
2.8.4 DME Indication 2-30
2.8.5 Marker Beacon Annunciations 2-30
2.8.6 Miscompare Annunciations 2-31
2.9 Radar Altimeter 2-32
2.10 Fast/Slow Indication 2-34
2.11 PFD Display Units 2-34
3 Multi-Function Display (MFD) 3-1
3.1 Navigation Map Pages 3-2
3.1.1 Default Navigation Map Page 3-3
3.1.2 Map Overlay Icons 3-4
3.1.3 Selecting Page Options 3-4
3.1.4 Changing the Navigation Map Range 3-5
3.1.5 Decluttering Map Pages 3-5
3.1.6 Panning 3-7
3.1.7 Selecting Items on the Map 3-8
3.1.8 Measuring Distances 3-9
3.1.9 Customizing Navigation Map Pages 3-10

3.1.10 Map Setup 3-10
3.1.10.1 Map Feature Options 3-12
3.1.10.2 Weather Feature Options (Optional) 3-21
3.1.10.3 Traffic Feature Options (Optional) 3-24
3.1.10.4 Aviation Feature Options 3-25
3.1.11 Split Screen (Optional) 3-30
3.2 Aux Mode Pages 3-31
3.2.1 System Settings 3-31
3.2.1.1 Display Brightness 3-32
3.2.1.2 Airspeed Reference Marks 3-33
3.2.1.3 PFD Options - Wind Vector 3-34
3.2.1.4 PFD Options - Nav Status 3-35
3.2.1.5 Temperature Reference 3-35
3.2.1.6 Synchronization (Dual Installations Only) 3-36
3.2.1.7 Date and Time 3-38
3.2.1.8 MFD Display Units 3-39
3.2.1.9 System Display Units 3-40
3.2.2 Sirius XM Satellite Radio XM Information (Optional) 3-41
3.2.3 Sirius XM Satellite Radio XM Entertainment Radio (Optional) 3-42
3.2.4 System Status 3-43
3.2.4.1 Database Sync Operation 3-44
3.2.4.2 Resolving Database Conflicts 3-48
3.2.5 ADS-B/FIS-B Status (optional) 3-50
3.2.6 External Video (optional) 3-51
3.2.6.1 Select Video Source 3-51
3.2.6.2 Zoom 3-52
3.2.6.3 Panning 3-52
3.2.6.4 Setup 3-52
3.2.6.5 Restore Defaults 3-54
3.2.6.6 Full Screen 3-55
3.2.7 Position Reporting (optional) 3-56
3.2.7.1 Status 3-56
3.2.7.2 Report Type 3-56
3.2.8 Iridium Phone Operation (Optional) 3-59
3.2.8.1 Status 3-59
3.2.8.2 Managing the Phone Book 3-61
3.2.8.3 Phone Volume 3-64
3.2.8.4 Making a Phone Call 3-65

3.2.8.5 Answering a Phone Call 3-66
3.3 Flight Plan Pages 3-67
3.3.1 Active Flight Plan Page 3-67
3.3.1.1 Active Flight Plan Detail 3-68
3.3.1.2 Active Flight Plan Options 3-68
3.3.1.3 Setting the Altitude Minimums Alerter 3-69
3.3.2 Waypoint Information Page 3-70
3.3.2.1 Selecting a Waypoint 3-71
3.3.2.2 Waypoint/Runway/Frequency Information Detail 3-72
3.3.2.3 Airport Directory 3-75
3.3.2.4 Waypoint Weather Information (Optional) 3-76
3.3.3 Charts Page (Optional) 3-77
4 Hazard Avoidance 4-1
4.1 Terrain Details 4-1
4.1.1 Terrain Configurations 4-1
4.1.2 Terrain Scale 4-3
4.2 Terrain Altitude 4-4
4.2.1 Computing GPS Altitude for TAWS 4-4
4.2.2 Baro-Corrected Altitude Versus GPS-MSL Altitude 4-4
4.3 Terrain Proximity 4-5
4.3.1 Displaying Terrain Proximity 4-5
4.3.1.1 Terrain Proximity Page Display on the Terrain Page 4-5
4.3.1.2 Terrain Proximity Page Display on a Navigation Map Page 4-6
4.3.1.3 Terrain Proximity Page 120° Arc or 360° Rings 4-6
4.3.1.4 Terrain Proximity Page Aviation Data 4-7
4.3.2 Terrain Proximity Limitations 4-9
4.3.3 System Status 4-9
4.4 Terrain Awareness and Warning System (TAWS-B) Optional 4-10
4.4.1 TAWS-B Requirements 4-10
4.4.2 TAWS-B Limitations 4-10
4.4.3 Using TAWS 4-11
4.4.4 Displaying TAWS Data 4-11
4.4.4.1 TAWS Page 4-12
4.4.5 TAWS Alerts 4-16
4.4.5.1 TAWS-B Alerting Colors and Symbology 4-17
4.4.5.2 Excessive Descent Rate Alert 4-19
4.4.5.3 Forward Looking Terrain Avoidance 4-20

4.4.5.4 Premature Descent Alerting 4-20
4.4.5.5 Inhibiting/Enabling TAWS Alerting 4-22
4.4.5.6 Five-Hundred Aural Alert 4-22
4.4.5.7 Negative Climb Rate After Take-Off Alert (NCR) 4-23
4.4.5.8 TAWS Not Available Alert 4-24
4.4.5.9 TAWS Failure Alert 4-24
4.4.6 TAWS System Status 4-24
4.5 External TAWS 4-25
4.6 Terrain-SVT™ 4-26
4.6.1 Terrain-SVT Page 120° Arc or 360° Rings 4-27
4.6.2 Terrain-SVT Page Aviation Data 4-28
4.6.3 Inhibiting/Enabling Terrain-SVT Alerting 4-28
4.6.4 Synthetic Vision Alerts and Annunciations 4-29
4.7 Traffic Systems 4-31
4.7.1 TAS/TCAS 1 Traffic (Optional) 4-31
4.7.1.1 Displaying and Operating Traffic (TAS/TCAS Systems) 4-32
4.7.1.2 Switching from Standby Mode to Operating Modes 4-32
4.7.1.3 Range Ring 4-33
4.7.1.4 Altitude Display 4-33
4.7.1.5 TAS/TCAS Symbology 4-34
4.7.1.6 Traffic System Status 4-35
4.7.1.7 Traffic Pop-Up 4-37
4.7.2 TIS Traffic (Optional) 4-38
4.7.2.1 Traffic Map Page 4-38
4.7.2.2 TIS Symbology 4-40
4.7.2.3 TIS Limitations 4-41
4.7.2.4 TIS Alerts 4-43
4.7.2.5 TIS System Status 4-44
4.7.3 ADS-B Traffic (Optional) 4-47
4.7.3.1 Target Selection 4-47
4.7.3.2 Status 4-49
4.7.3.3 Motion Vector 4-50
4.8 XM WX Satellite Weather (Optional) 4-52
4.8.1 Using XM WX Satellite Weather Products 4-52
4.8.2 Customizing the XM WX Satellite Weather Map 4-53
4.8.3 XM WX Weather Symbols and Product Age 4-55
4.8.4 XM Weather Legends 4-58
4.8.5 XM NEXRAD 4-59

4.8.5.1 Reflectivity 4-61
4.8.5.2 NEXRAD Limitations 4-61
4.8.6 XM Weather Page Map Orientation 4-62
4.8.7 NEXRAD Data Viewing Range 4-63
4.8.8 NEXRAD Legend 4-63
4.8.9 NEXRAD Source 4-64
4.8.10 XM Echo Tops 4-65
4.8.11 XM Cloud Tops 4-67
4.8.12 XM WX Satellite Lightning 4-69
4.8.13 XM SIGMETs and AIRMETs 4-70
4.8.14 XM PIREPs 4-72
4.8.15 XM METARs 4-73
4.8.16 XM Winds Aloft 4-75
4.8.17 XM Surface Analysis and City Forecast 4-77
4.8.18 XM County Warnings 4-79
4.8.19 XM TFRs 4-80
4.8.20 XM Cell Movement 4-82
4.8.21 XM AIREPs 4-83
4.8.22 XM Cyclone 4-85
4.8.23 XM Freezing Level 4-86
4.8.24 XM Icing 4-87
4.8.25 XM Turbulence 4-88
4.9 Weather Radar 4-89
4.9.1 Garmin GWX 68 Radar Description 4-89
4.9.1.1 Principles of Pulsed Airborne Weather Radar 4-90
4.9.1.2 Antenna Beam Illumination 4-91
4.9.1.3 Radar Signal Attenuation 4-92
4.9.2 Radar Signal Reflectivity 4-93
4.9.2.1 Precipitation 4-93
4.9.2.2 Ground Returns 4-94
4.9.2.3 Angle of Incidence 4-94
4.9.3 Operating Distance 4-95
4.9.4 Basic Antenna Tilt Setup 4-96
4.9.5 Weather Mapping and Interpretation 4-97
4.9.5.1 Weather display Interpretation 4-97
4.9.5.2 Thunderstorms 4-98
4.9.5.3 Tornadoes 4-100
4.9.5.4 Hail 4-100

4.9.6 Radar Operation in Weather Mode....................................4-101
4.9.6.1 Displaying Weather on the Weather Radar Page.................4-102
4.9.6.2 Vertically Scanning a Storm Cell 4-103
4.9.6.3 Adjusting the Antenna Tilt Angle..4-104
4.9.6.4 Adjusting Gain 4-105
4.9.6.5 Sector Scan (GWX Radars Only)..4-107
4.9.6.6 Antenna Stabilization 4-108
4.9.6.7 Weather Attenuated Color Highlight (WATCH™) 4-108
4.9.6.8 Weather Alert (GWX Radars Only).....................................4-109
4.9.6.9 Altitude Compensated Tilt (ACT) - GWX 70 only.................4-110
4.9.6.10 Turbulence Detection - GWX 70 only (optional)..................4-110
4.9.6.11 Ground Clutter Suppression (GCS) - GWX 70 only (optional) 4-110
4.9.7 Ground Mapping and Interpretation 4-111
4.10 GFDS Weather (Optional)..4-112
4.10.1 GFDS Registration 4-113
4.10.1.1 Register With GFDS 4-113
4.10.1.2 Deactivate Unit Registration With GFDS 4-114
4.10.2 Using GFDS Satellite Weather Products 4-114
4.10.3 Customizing the GFDS Weather Map 4-115
4.10.4 GFDS Data Request..4-116
4.10.4.1 GFDS Data Request Coverage..4-117
4.10.4.2 GFDS Data Request Auto Request....................................4-120
4.10.4.3 GFDS Data Request Manual Request................................4-121
4.10.4.4 GFDS Data Request Status Window 4-121
4.10.5 Weather Page Map Orientation...4-121
4.10.6 Precipitation (PRECIP) Data Viewing Range 4-122
4.10.7 PRECIP Legend..4-123
4.10.8 GFDS Infrared Satellite (IR SAT) Data Viewing Range 4-124
4.10.9 Data Link Lightning (DL LTNG) Data Viewing Range............4-125
4.10.10 SIGMETs and AIRMETs (SIG/AIR)......................................4-126
4.10.11 AIREP/PIREP...4-128
4.10.12 METARs 4-130
4.10.13 Winds Aloft 4-132
4.10.14 GFDS TFRs..4-134
4.11 FIS-B Weather (Optional)...4-136
4.11.1 NEXRAD Abnormalities...4-136
4.11.2 NEXRAD Limitations..4-136

4.11.3 NEXRAD Intensity 4-137
4.11.4 NEXRAD 4-137
4.11.5 NEXRAD Weather Setup 4-138
4.11.5.1 Weather Page Map Orientation 4-138
4.11.5.2 NEXRAD Data Viewing Range 4-138
4.11.5.3 NEXRAD Legend 4-139
4.11.5.4 NEXRAD Source 4-140
4.11.5.5 SIGMETs and AIRMETs (SIG/AIR) 4-142
4.11.5.6 AIREP/PIREP 4-145
4.11.5.7 METARs 4-147
4.11.5.8 Winds Aloft 4-149
4.11.5.9 FIS-B TFRs 4-150
4.11.6 FIS-B Product Times 4-151
4.12 Stormscope 4-152

5 Additional Features (Optional) 5-1

5.1 Viewing FliteCharts and ChartView 5-2
5.1.1 ChartView (Optional) 5-3
5.1.2 FliteCharts® 5-4
5.1.3 Determining Chart Database Type, Coverage, and Currency 5-5
5.1.4 Selecting a Chart 5-7
5.1.4.1 Selecting FliteCharts or ChartView 5-7
5.1.4.2 Selecting a New Chart by FPL, NRST, or RECENT 5-8
5.1.4.3 Selecting a Chart Manually 5-8
5.1.4.4 Chart Auto-Selection 5-9
5.1.5 Using Charts 5-11
5.1.5.1 Chart Zooming and Panning 5-12
5.1.5.2 Viewing Chart Details in ChartView 5-13
5.1.5.3 Setting the Altitude Minimums Alerter 5-15
5.1.5.4 Viewing Chart NOTAMs 5-16
5.1.5.5 Day/Night View 5-17

5.2 SafeTaxi® 5-18
5.2.1 Using SafeTaxi® 5-19
5.2.1.1 Decluttering 5-19
5.2.1.2 Hot Spot Information 5-19
5.2.2 SafeTaxi® Cycle Number and Revision 5-21
5.3 Sirius XM Satellite Radio Entertainment 5-22
5.3.1 Activating Sirius XM Satellite Radio Services 5-22

5.3.2 Sirius XM Satellite Radio Information 5-24
5.3.3 Sirius XM Satellite Radio Entertainment 5-25
5.3.3.1 Channel Categories 5-26
5.3.3.2 Selecting a Sirius XM Satellite Radio Channel 5-27
5.3.3.3 Sirius XM Satellite Radio Volume 5-28
5.3.3.4 Sirius XM Satellite Radio Channel Presets 5-29
5.3.4 GDL 69/69A Data Link Receiver Troubleshooting 5-30
5.4 Autopilot Operation 5-31
5.4.1 GAD 43 Attitude 5-31
5.4.2 Heading 5-32
5.4.3 Altitude Capture (Optional Upgrade) 5-32
5.4.4 Autopilot Navigation 5-33
5.4.4.1 Autopilot Operation with GPSS Enabled Autopilots 5-33
5.4.4.2 Autopilot Operation with the GDU 620 Emulating GPSS 5-34
5.4.5 Flight Director Display 5-34
5.4.6 Vertical Speed Control 5-35
5.4.7 Autopilot Mode Annunciations 5-36
5.5 Synthetic Vision Technology (Optional) (SVT™) 5-37
5.5.1 SVT™ Operation 5-39
5.5.2 Activating and Deactivating SVT™ 5-40
5.5.3 SVT™ Features 5-41
5.5.3.1 Flight Path Marker (FPM) 5-41
5.5.3.2 Zero-Pitch Line 5-41
5.5.3.3 Horizon Heading 5-42
5.5.3.4 Airport Signs 5-42
5.5.3.5 Runway Depiction 5-43
5.5.3.6 Traffic 5-44
5.5.3.7 Obstacles 5-44
5.5.3.8 Unusual Attitudes 5-45
6 Annunciations and Alerts 6-1
6.1 Alerts 6-1
6.2 System Status 6-14
7 Symbols 7-1
7.1 Map Page Symbols 7-1
7.2 SafeTaxi™ Symbols 7-2
7.3 Traffic Symbols 7-2
7.4 Terrain Obstacle Symbols 7-4

7.5 Basemap Symbols 7-5
7.6 Map Tool Bar Symbols 7-6
7.7 Miscellaneous Symbols 7-7
8 Glossary 8-1
Appendix A A-1
SD Card Use and Databases A-1
  Jeppesen Databases A-3
  Updating the Jeppesen Database A-3
  Garmin Databases A-5
  Updating Garmin Databases A-7
Index B-1

Electronic Document Features

Versions of this guide are saved in the Adobe Portable Document Format (pdf) and have features that help the user navigate more easily. The Table of Contents, Index, side tabs (i.e., Sec 2 PFD, Sec 3 MFD, etc.), and the TOC and Cover boxes at the top of pages are hyperlinks that will take you directly to the selected item.

Versions of aviation products in the pdf format are available at www.garmin.com.

1 SYSTEM OVERVIEW

1.1 System Description

This section provides an overview of the G500/600 Avionics Display System. The G500/600 system is an integrated display system that presents primary flight instrumentation, navigation, and a moving map to the pilot through large-format displays.

In normal operating mode, the Primary Flight Display (PFD) presents graphical flight instrumentation (attitude, heading, airspeed, altitude, vertical speed), replacing the traditional flight instrument cluster. The Multi-Function Display (MFD) normally displays a full-color moving map with navigation information, as well as supplemental data.

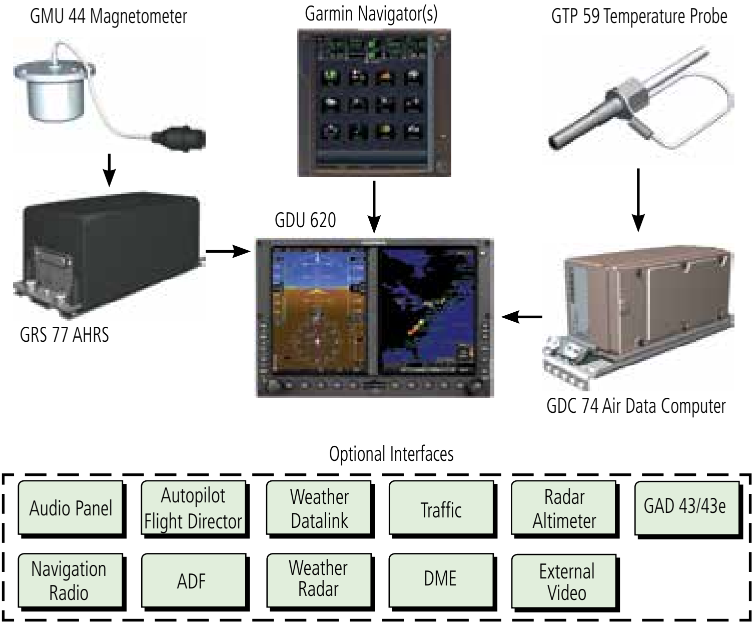

GMU 44 Magnetometer
Garmin Navigator(s)
GTP 59 Temperature Probe
GDU 620
GRS 77 AHRS
GDC 74 Air Data Computer
Optional Interfaces
Audio Panel
Autopilot Flight Director
Weather Datalink
Traffic
Radar Altimeter
GAD 43/43e
Navigation Radio
ADF
Weather Radar
DME
External Video

Figure 1-1 G500/600 System (LRU Configuration)

The system consists of the following Line Replaceable Units (LRUs):

- **GDU 620** Primary Flight Display (PFD) and Multi Function Display (MFD)
- **GDC 74A/74B** Air Data Computer (ADC)
- **GRS 77** Attitude and Heading Reference System (AHRS)

- **Temperature Probe** (such as the GTP 59)
- **GMU 44** Magnetometer
- At least one of the following: **GNS 480, CNX80, GNS 400W series, GNS 500W series, GTN 600 series, GTN 700 series,** or a compatible GPS Navigator

Interfaces to various other aircraft systems and equipment are supported, including:

- **GAD 43/43e** Adapter
- **GDL 69/69A** Satellite Data Link Receiver
- **GDL 88** ADS-B Transceiver
- **GSR 56** Satellite Data Link Receiver
- **NavCom -** Garmin GTR/GNC or SL30 COM/NAV radios, or selected 3rd-party radios
- **Autopilot/Flight Director**
- **ADF**
- **Garmin GTS or GTX** traffic awareness systems, or selected 3rd party devices
- **Audio Panel**
- **Garmin GWX** radar systems or selected 3rd party radars
- **Radar Altimeter**
- **Video Sources**
- **Stormscope®**

System Feature	G500	G600
Approved for Class 1 Aircraft (typically piston singles under 6,000 lbs.)	Yes	Yes
Approved for Class 2 Aircraft (typically piston twins and turbine aircraft under 6,000 lbs.)	Yes	Yes
Approved for Class 3 Aircraft (typically piston or turbine aircraft between 6,000 lbs. and 12,500 lbs)	No	Yes
Software design assurance level	Level C	Level B
Garmin SVT Synthetic Vision Technology	Optional	Standard
GAD 43/43e replaces old A/P gyro attitude with AHRS references; GAD 43e adds additional interfaces with other avionics	Optional	Standard
GWX 68/70 Radar interface (radar LRU sold separately)	Optional	Standard
Interface support for other ARINC 708 radars	Optional	Optional
RVSM capable on select aircraft	No	Optional
Internal TAWS-B terrain alerting	No	Optional

Table 1-1 G500/G600 System Comparison

1.1.1 Standard System Line Replaceable Units (LRU)

This guide covers the operation of the GDU 620 display as integrated in the G500/600 system. The G500/600 Avionics Display System is an avionics suite designed to replace the traditional flight instrument cluster. The system combines primary flight instrumentation, navigational information, and a moving map all displayed on dual color screens. The G500/600 system is composed of sub-units or Line Replaceable Units (LRUs). LRUs have a modular design and can be installed directly behind the instrument panel or in a separate avionics bay if desired. This design greatly eases troubleshooting and maintenance of the G500/600 system. A failure or problem can be isolated to a particular LRU, which can be replaced quickly and easily. Each LRU has a particular function, or set of functions, that contributes to the system's operation.

1.1.1.1 GDU 620

The GDU 620 has dual VGA (640 x 480 pixels) 6.5 inch LCD displays. The left side of the GDU is a PFD and the right side is the MFD. In some models or installations, the PFD and MFD and their controls are switched to the other side. The MFD shows a moving map, flight plan, weather, and other supplemental data. The PFD shows primary flight information, in place of traditional pitot-static and gyroscopic systems and also provides an HSI for navigation.

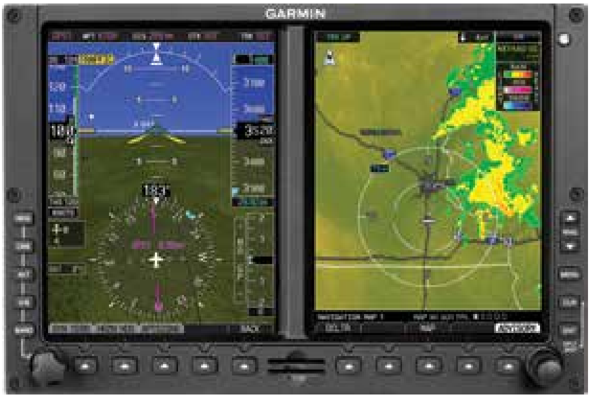


Figure 1-2 GDU 620 PFD and MFD

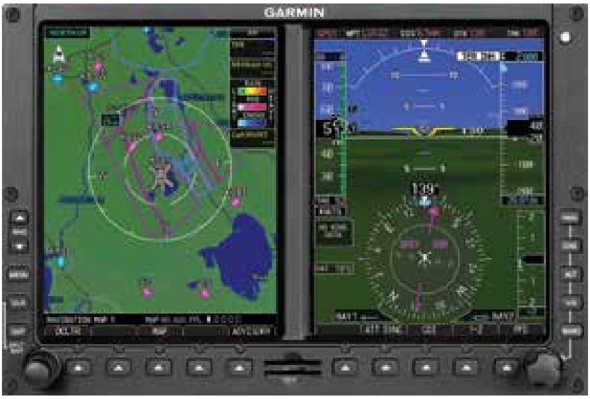


Figure 1-3 GDU 620 PFD and MFD with PFD on Right

1.1.1.2 GDC 74A/74B

The GDC 74A/74B Air Data Computer (ADC) compiles information from the pitot/static system and an Outside Air Temperature (OAT) sensor. The GDC 74A/74B provides pressure altitude, airspeed, vertical speed, and OAT information to the G500/600 system. The GDC 74A/74B communicates with the GDU 620 and GRS 77 using an ARINC 429 digital interface.

Figure 1-4 GDC 74A/74B Air Data Computer

1.1.1.3 GRS 77

The GRS 77 is an Attitude and Heading Reference System (AHRS) unit that provides aircraft attitude information to the G620 display. The unit contains advanced tilt sensors, accelerometers, and rate sensors. In addition, the GRS 77 interfaces with both the GDC 74A/74B Air Data Computer and the GMU 44 magnetometer. The GRS 77 also utilizes GPS data forwarded from the GDU 620. Actual attitude and heading information is sent to the GDU 620 using an ARINC 429 digital interface.

Figure 1-5 GRS 77 AHRS

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77 and is only updated once every five years. The IGRF model is part of the Navigation Database. At system power-up, the IGRF models in the GRS 77 and in the Navigation Database are compared, and if the IGRF model in the GRS 77 is out of date, the user is prompted to update the IGRF model in the GRS 77. The prompt will appear after the G500/600 splash screen is acknowledged on the MFD.

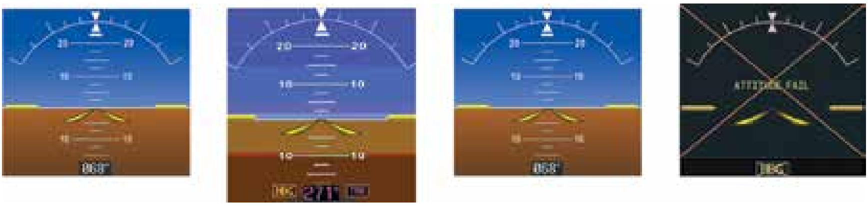
Attitude Heading Reference System (AHRS)

***NOTE:** Aggressive maneuvering while AHRS is not operating in normal mode may degrade AHRS accuracy.*

Attitude and heading information is displayed on the PFD when the AHRS receives appropriate combinations of information from the external sensor inputs.

AHRS Inputs			AHRS Mode	AHRS Outputs	
GPS	Magnetometer	Air Data		Attitude	Heading
Available	Available	—	Normal	Available	Available
Available	Unavailable	Available	No Mag	Available	GPS Track
Available	Unavailable	Unavailable	No Air/ No Mag	Available	GPS Track
Unavailable	Available	Available	No GPS	Available	Available
Unavailable	Available	Unavailable	Fail	Unavailable	Unavailable
Unavailable	Unavailable	—	Fail	Unavailable	Unavailable

Table 1-2 AHRS Operation



AHRS Normal Operation

Heading Invalid

AHRS No-GPS Mode

Attitude/Heading Invalid

Figure 1-6 AHRS Operation

Loss of GPS, magnetometer, or air data inputs is communicated to the pilot by message advisory alerts (refer to Section 6 for specific AHRS alert information). Any failure of the internal AHRS inertial sensors results in loss of attitude and heading information (indicated by red “X” flags over the corresponding flight instruments).

A maximum of two GPS inputs are provided to the AHRS. If GPS information from one of the inputs fails, the AHRS uses the remaining GPS input and an alert message is issued to inform the pilot. If both GPS inputs fail, the AHRS will continue to provide attitude and heading information to the PFD as long as magnetometer and airspeed data are available and valid.

If the magnetometer input fails, the AHRS continues to output valid attitude information and GPS Track information is used; however, the heading display on the PFD is flagged as invalid with a red "X," "TRK" in magenta is annunciated to the right of the Track value, and the Track value color is changed from white to magenta.

***NOTE:** In this case the magnetic standby compass and GPS ground track can be used to keep the aircraft on the desired heading.*

Note that SVT is turned off in "track-based reversionary mode." SVT will automatically re-enable when heading is restored. Also, map orientations change from HDG UP to TRACK UP and Map orientations will change back to HDG up when heading is restored.

When heading fails the heading bug is not removed and the GDU continues driving the autopilot heading error output using track in place of heading.

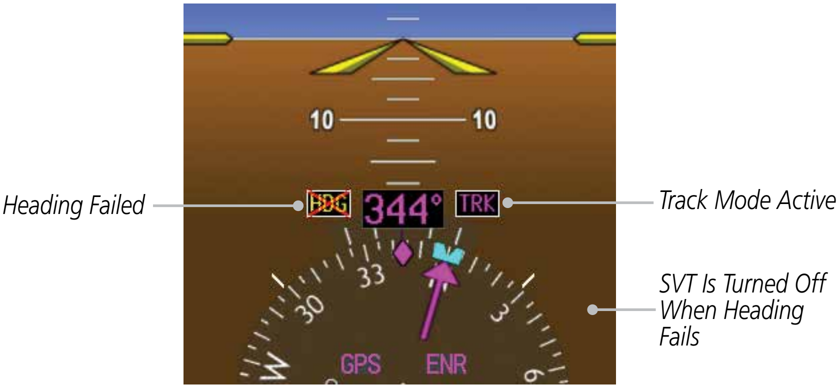


Figure 1-7 Track Mode shown as Active when Heading Info has failed

Failure of the air data input has no effect on the AHRS output while AHRS is receiving valid GPS information. Invalid or unavailable airspeed data in addition to complete GPS failure results in loss of all attitude and heading information.

***NOTE:** Fastest AHRS alignment is achieved with the aircraft stationary and with all AHRS inputs valid (3-D GPS position, magnetometer, and air data). During initial power up on the ground, no GPS position and/or magnetic anomalies are common. If the aircraft is taxied prior to AHRS alignment, alignment may be delayed until after a valid 3-D GPS position is available.*

NOTE: *During in-flight alignment of the AHRS, minimize aircraft maneuvering. The AHRS will align with shallow banking and pitch angles (less than 20 degrees of roll or 5 degrees of pitch). AHRS alignment may not be possible during more aggressive maneuvers.*

1.1.1.4 GMU 44

The GMU 44 magnetometer senses the earth's magnetic field. Data is sent to the GRS 77 AHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77 and communicates with the GRS 77 using a RS-485 digital interface.

Figure 1-8 GMU 44 Magnetometer

1.1.1.5 GTP 59

The GTP 59 temperature probe provides Outside Air Temperature (OAT) data to the GDC 74A/74B.

Figure 1-9 GTP 59 Temperature Probe

1.1.1.6 Garmin Navigator Interface

The G500/600 system requires connection to at least one external Garmin WAAS GPS navigator, such as the 400W/500W series, GTN 600/700 series, or GNS 480.

1.1.2 Optional Line Replaceable Units (LRU)

A variety of LRUs are available to expand and enhance the G500/600 system.

1.1.2.1 GDL 88 (Optional)

The GDL 88 is a remotely mounted ADS-B transceiver. There are four models of the GDL 88. Models with a single bottom mounted UAT antenna meet TSO C154c Class A1S and are available with or without an internal GPS/SBAS receiver. Models with one top mounted and one bottom mounted antenna meet TSO C154c Class A1H and are also available with or without an internal GPS/SBAS receiver.

1.1.2.2 Weather Radar

The Garmin GWX system, or selected 3rd party radar, provides airborne weather and ground mapped radar data to the MFD.

Figure 1-10 GWX 68 Weather Radar

1.1.2.3 Stormscope® (Optional)

***NOTE**: Refer to the WX-500 Pilot's Guide for a detailed description of the WX-500 StormScope.*

The WX-500 StormScope Weather Mapping Sensor is a passive weather avoidance system that detects electrical discharges associated with thunderstorms within a 200 NM radius of the aircraft. The StormScope measures relative bearing and distance of thunderstorm-related electrical activity and reports the information to the display. ***Interfaces are currently only available for the WX-500 StormScope System***.

1.1.2.4 GSR 56 (Optional)

The GSR 56 is an Iridium® satellite transceiver that supports voice telephone calls, aircraft position reporting, and world wide weather products.

1.1.2.5 GDL 69/69A (Optional)

The GDL 69/69A is a Sirius XM Satellite Radio Data Link Receiver that receives broadcast weather data. The GDL 69A is the same as the GDL 69 with the addition of an Sirius XM Satellite Radio audio entertainment receiver. Weather data and control of audio channel and volume is displayed on the MFD, via a High-Speed Data Bus (HSDB) Ethernet connection. The GDL 69A is also interfaced to an audio panel for distribution of the audio signal. A subscription to the Sirius XM Satellite Radio service is required to enable the GDL 69/69A capability. Subscription information is available at: http://www.garmin.com/xm/.

Figure 1-11 GDL 69/69A XM Satellite Radio Data Link Receiver

1.1.2.6 GAD 43/43e (Optional)

The GAD 43 is an adapter that converts AHRS digital pitch, roll, heading and yaw rate data into analog signals used by autopilot systems. The GAD 43 is installed remotely between the AHRS and an existing autopilot. The analog signals from the GAD 43 mimic those of spinning-mass gyros that provide data to the autopilot and allow the gyro to be replaced by the AHRS and GAD 43 combination.

The GAD 43e performs the same functions as the GAD 43, but adds support for additional interfaces to various aircraft systems. The GAD 43e supports interfaces to various autopilots (for altitude preselect and vertical speed control), analog NAV radios, DME, analog radar altimeters, marker beacons, and ADF receivers.

Figure 1-12 GAD 43/43e AHRS Adapter

1.1.2.7 GTX 330/330D (Optional)

1200
01:23:20

Figure 1-13 GTX 330/330D Mode S Transponder

The GTX 330/330D is a solid-state transponder that provides Modes A, C, and S functions. The transponder provides traffic information to the display through an ARINC 429 digital interface.

***NOTE**: GTX 33/33D can also be used to display traffic information on the GDU 620.*

1.2 System Power Up

✓ ***NOTE:** See the Aircraft Flight Manual (AFM) for specific procedures concerning avionics power application and emergency power supply operation.*

✓ ***NOTE:** Refer to Section 6 for system-specific annunciations and alerts.*

The G500/600 System is integrated with the aircraft electrical system and receives power directly from electrical busses. The GDU 620 and supporting sub-systems include both power-on and continuous built-in test features that exercise the processor, memory, external inputs, and outputs to ensure safe operation.

During system initialization, test annunciations are displayed. All system annunciations should disappear typically within the first 30 seconds after power-up. Upon power-up, bezel key backlights also become momentarily illuminated on the GDU 620 display bezel.

On the PFD, the AHRS begins to initialize and "AHRS ALIGN: Keep Wings Level" is displayed. The AHRS should display valid attitude and heading fields typically within the first minute after power-up. The AHRS can align itself both while taxiing and during level flight.

✓ ***NOTE:** Fastest AHRS alignment is achieved with the aircraft stationary and with all AHRS inputs valid (3-D GPS position, magnetometer, and air data). During initial power up on the ground, no GPS position and/or magnetic anomalies are common. If the aircraft is taxied prior to AHRS alignment, alignment may be delayed until after a valid 3-D GPS position is available.*

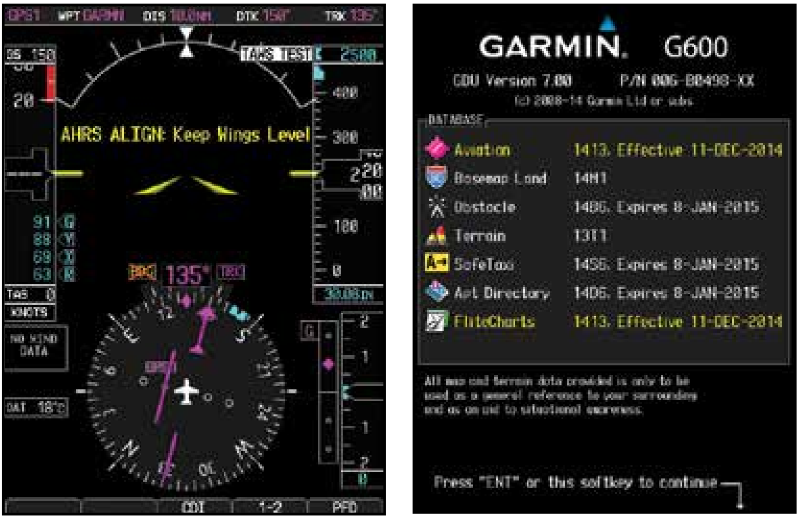
✓ ***NOTE:** During in-flight alignment of the AHRS, minimize aircraft maneuvering. The AHRS will align with shallow banking and pitch angles (less than 20 degrees of roll or 5 degrees of pitch). AHRS alignment may not be possible during more aggressive maneuvers.*

When the MFD powers up, the splash screen displays the following information:

- Software version and part number
- Basemap database version

- Terrain database version
- Obstacle database expiration date
- Aviation database expiration date
- Airport Directory database expiration date
- Chart database status

Databases are displayed in white if they are determined to be current. Databases are displayed in yellow if they have expired, are not yet effective, or if the current date/time is not yet available from the GPS.



GARMIN G600

GDU Version 7.00 P/N 006-B0498-XX

(c) 2008-14 Garmin Ltd or subs

DATABASE

Aviation	1413, Effective 11-DEC-2014
Basemap Land	14M1
Obstacle	1406, Expires 8-JAN-2015
Terrain	13T1
SafeTaxi	1456, Expires 8-JAN-2015
Apt Directory	1406, Expires 8-JAN-2015
FliteCharts	1413, Effective 11-DEC-2014

All map and terrain data provided is only to be used as a general reference to your surrounding and as an aid to situational awareness.

Press "ENT" or this softkey to continue

Figure 1-14 System Startup Pages

Pressing the **ENT** key (or soft key indicated by the arrow) acknowledges this information and displays the Navigation Map Page. When the interfaced GPS unit has acquired a sufficient number of satellites to determine a position, the aircraft's current position is shown on the Navigation Map Page.

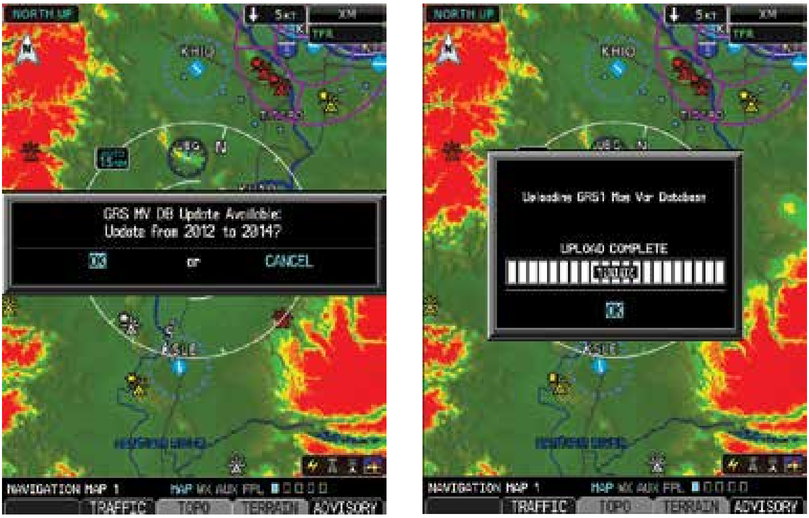
1.3 International Geomagnetic Reference Field

The IGRF (International Geomagnetic Reference Field) model is contained in the GRS 77 and is only updated once every five years. The IGRF model is part of the Navigation Database. At system power-up, the IGRF models in the GRS 77 and in the Navigation Database are compared, and if the IGRF model in the GRS 77 is out of date, the user is prompted to update the IGRF model in the GRS 77. The following prompt will appear after the G500/600 splash screen is acknowledged on the MFD.

> GRS MV DB UPDATE AVAILABLE.UPDATE FROM yyyy TO yyyy (e.g. 2012 to 2014)

Follow the on-screen instructions.

1) When the Update message appears, to start the update process press the **ENT** key with "OK" highlighted. To update at another time, turn the **Large** knob to highlight "Cancel" and then press **ENT**.



GRS MV DB Update Available:
Update from 2012 to 2014?

Uploading GRS1 Mag Var Database

UPLOAD COMPLETE

Figure 1-15 GRS MV DB Update

2) After the update is complete, press the **ENT** key to continue normal operation.

1.4 System Operation

***NOTE:** Refer to Section 6 for detailed descriptions of all alerts and annunciations.*

1.4.1 Pilot Controls

The GDU 620 controls have been designed to simplify operation of the system and minimize workload and the time required to access functionality. Controls are located on the PFD and MFD bezels and are comprised of a PFD knob, MFD dual concentric knobs, bezel keys, and soft keys.

1.4.1.1 PFD Knob

Pressing the **PFD** knob performs the default action for the selected mode. Refer to the PFD Bezel Keys section for details.

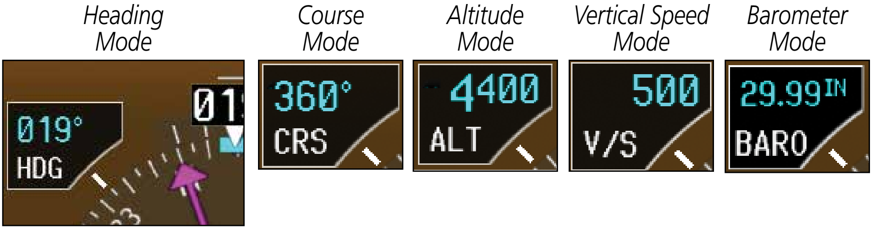


Figure 1-16 Selection Modes Adjusted with the PFD Knob

***NOTE:** After 10 seconds of inactivity in another mode, the **PFD** knob selected mode will revert to Heading mode.*

1. Press the desired PFD mode selection key (**HDG**, **CRS**, **ALT**, **V/S**, or **BARO**). A window will be displayed near the upper left corner of the HSI showing the current value for that mode.
2. Turn the **PFD** knob to select the desired value.

1.4.1.2 PFD Bezel Keys

***NOTE:** See Section 5.6 for autopilot functions using the PFD Bezel Keys.*

Heading (HDG)

Selects Heading Select mode. This is the default mode for the **PFD** knob. Pressing the **PFD** knob in Heading mode will center the Heading Bug on the current Heading. Set the heading bug on the HSI by turning the **PFD** knob after pressing the **HDG** key.

Course (CRS)

Selects Course Select mode. Pressing the **PFD** knob in Course mode will center the CDI for a VOR or GPS OBS course.

Altimeter (ALT)

Selects Altitude Select mode. Pressing the **PFD** knob in Altitude Select mode will enter the current altitude in the Altitude Select window. Set the Altitude Bug by turning the **PFD** knob after pressing the **ALT** key.

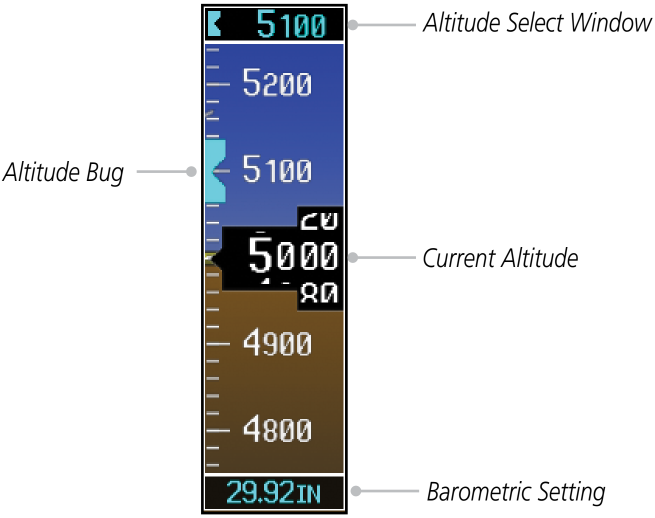

5100
Altitude Select Window
5200
Altitude Bug
5100
20
5000
80
Current Altitude
4900
4800
29.92IN
Barometric Setting

Figure 1-17 Pressing PFD Knob Sets Altitude Select to Current Altitude

Vertical Speed (V/S)

Selects Vertical Speed (V/S) mode. Pressing the **PFD** knob in V/S mode will synchronize the bug to the current vertical speed.

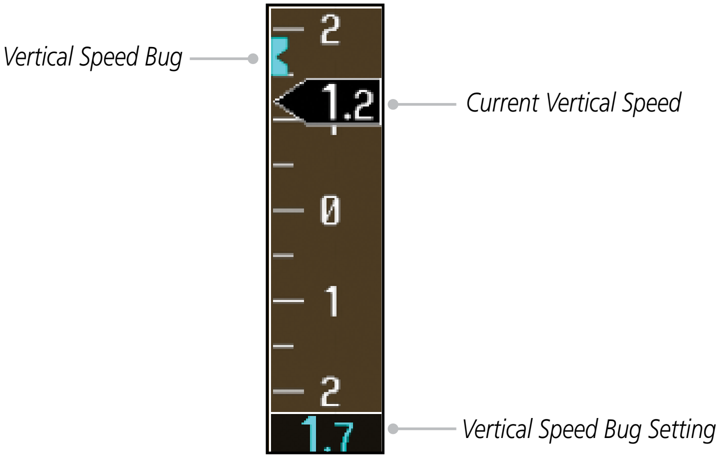

Vertical Speed Bug
2
1.2
Current Vertical Speed
0
1
2
1.7
Vertical Speed Bug Setting

Figure 1-18 Pressing V/S Knob Sets Vertical Speed Bug to Current Vertical Speed

For aircraft with vertical speed operating limitations, red bands showing Vertical Speed Maximum and Minimum ranges will be shown on the left side of the Vertical Speed tape. When the Vertical Speed Indicator is in one of the red ranges, the background color of the Vertical Speed Indicator will turn red.

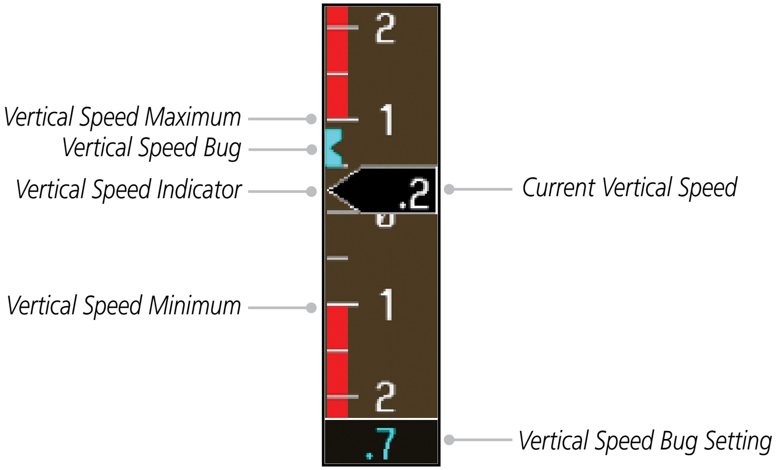

2
Vertical Speed Maximum
1
Vertical Speed Bug
Vertical Speed Indicator
.2
Current Vertical Speed
Vertical Speed Minimum
1
2
.7
Vertical Speed Bug Setting

Figure 1-19 Vertical Speed Warning Indication

Barometer (BARO)

Selects Barometric Setting Select mode. Pressing the **PFD** knob in Baro mode toggles between standard pressure (29.92 in/1013 mb) and the previously selected value.

1.4.1.3 MFD Knobs

The **MFD** knobs are for navigating and selecting information on the MFD pages. More details are provided in the MFD section.

Small (Inner) MFD Knob

Selects a specific page within a page group. Pressing the small **MFD** knob turns the selection cursor ON and OFF. When the cursor is ON, data may be entered in the applicable window by turning the small and large **MFD** knobs. In this case, the large **MFD** knob moves the cursor on the page and the small **MFD** knob selects individual characters or values for the highlighted cursor location.

Large (Outer) MFD Knob

Selects the MFD page group. When the cursor is ON, the large **MFD** knob moves the cursor to highlight available fields.

1.4.1.4 MFD Bezel Keys

Range (RNG)

Pressing the Range arrow keys changes the range on the Map pages. The Up arrow zooms out. The Down arrow zooms in. The keys also aid in scrolling up and down text pages.

Menu

Displays a context-sensitive list of options. This list allows the user to access additional features or make setting changes that relate to particular pages.

Enter (ENT)

Validates or confirms a menu selection or data entry.

Clear (CLR)

Erases information, cancels entries, or removes page menus. Pressing and holding the **CLR** key displays the Navigation Map 1 page.

1.4.2 Using the Soft Key Controls

The soft keys are located along the bottoms of the displays. The soft key labels shown depend on the soft key level or page being displayed. The bezel keys below the soft keys can be used to select the appropriate soft key.

MFD functions indicated by the soft key labels vary depending on the page selected and are located at the bottom of the MFD display. Press the soft key located directly below the soft key label. To select the function indicated on the soft key label, press the soft key directly below the label.

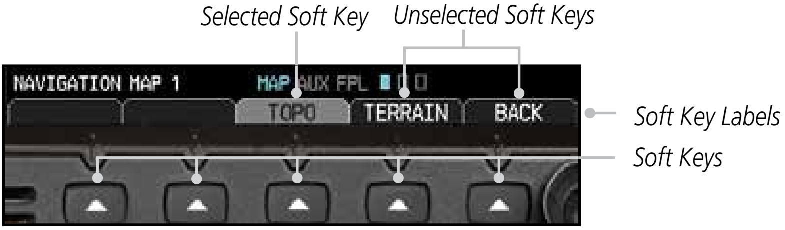


Figure 1-20 MFD Soft Key Layout

1.4.3 Using the Page Menus

The GDU 620 has a dedicated **MENU** key that when pressed displays a context-sensitive list of options for functions in the MFD. This options list allows the user to access additional features or make settings changes which specifically relate to the currently displayed window/page. There is no all-encompassing menu. Some menus provide access to additional submenus that are used to view, edit, select, and review options. Menus display "No Options" when there are no options for the window/page selected. Soft key presses do not display menus or submenus.

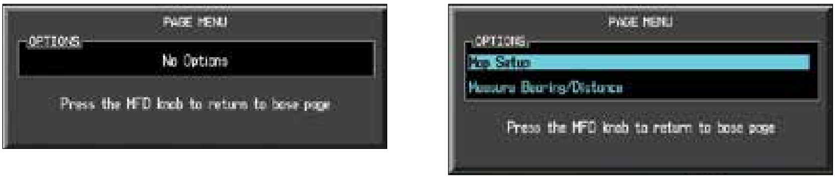
Navigating within a Menu

1) Press the **MENU** key to display the menu.

2) Turn the small or large **MFD** knob to scroll through a list of available options (a scroll bar always appears to the right of the window/box when the option list is longer than the window/box).

3) Press the **ENT** key to select the desired option.

4) Press the **CLR** key or **MFD** knob to remove the menu and cancel the operation.



No Options Available

PAGE MENU
OPTIONS
No Options
Press the MFD knob to return to base page

Options for MAP Window

PAGE MENU
OPTIONS
Map Setup
Measure Bearing/Distance
Press the MFD knob to return to base page

Figure 1-21 Page Menu Examples

1.4.4 System Settings

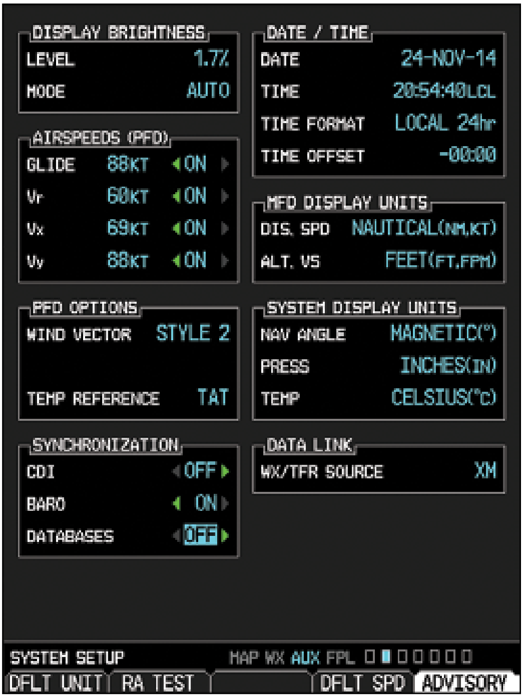
G500/600 system settings are managed from the Aux Mode System Setup Page.

More detail on changing settings is in the Section 3 - MFD Aux pages System Settings section.

1) From the first AUX page, press the small **MFD** knob and turn the large **MFD** knob to highlight the desired value.

2) Turn the small **MFD** knob to select "ON" or "OFF."

3) Press **ENTER** to save the setting.



DISPLAY BRIGHTNESS
LEVEL 1.7%
MODE AUTO

AIRSPEEDS (PFD)
GLIDE 88KT ON
Vr 60KT ON
Vx 69KT ON
Vy 88KT ON

PFD OPTIONS
WIND VECTOR STYLE 2
TEMP REFERENCE TAT

SYNCHRONIZATION
CDI OFF
BARO ON
DATABASES OFF

DATE / TIME
DATE 24-NOV-14
TIME 20:54:40LCL
TIME FORMAT LOCAL 24hr
TIME OFFSET -00:00

MFD DISPLAY UNITS
DIS, SPD NAUTICAL(NM,KT)
ALT, VS FEET(FT,FPM)

SYSTEM DISPLAY UNITS
NAV ANGLE MAGNETIC(°)
PRESS INCHES(IN)
TEMP CELSIUS(°C)

DATA LINK
WX/TFR SOURCE XM

Figure 1-22 System Setup Page

Category	Settings	Affected Quantities	Exceptions
Display Brightness	Level Mode	Brightness levels on the PFD and MFD	
Airspeeds	Glide (or REF) V_R V_X (OR V1) V_Y (OR V2)	Reference markers on PFD airspeed tape	
Synchronization	CDI - On/Off BARO - On/Off Databases - On/Off	Crossfill Nav information to GDU 620 Share databases	
PFD Options (Wind Vector) (NAV Status)	Off, Style 1 - Style 4 Style 1 - 2	PFD wind vector display format. Location of GPS navigation data.	Nav Status option not available in all installations.
Date/Time	Date Time Time Format Time Offset		
Temperature Reference	SAT, TAT, ISA		
Distance and Speed	Imperial (SM, MPH) Metric (KM, KPH) Nautical (NM, KT)	Bearing distances (information windows) Distance (information window) Flight plan distances Map ranges DIS field (Navigation Status Box) All distances on MFD All speeds on MFD	Airspeed Indicator True Airspeed Wind speed vector Map range (Traffic Page, Terrain Proximity Page)
Altitude and Vertical Speed	Feet Meters	All elevations on MFD	Altimeter Vertical Speed Indicator

Category	Settings	Affected Quantities	Exceptions
Navigation Angle	Magnetic (North) True (North)	Heading Course Bearing Track Desired Track	
Barometric Setting	Inches (in) Hectopascals (hpa)	Barometric pressure on PFD	
Temperature	Celsius Fahrenheit	All temperatures on PFD	
Data Link (WX/ TFR Source)	XM FIS GFDS	Select weather source.	

Table 1-3 Display Units Settings (System Setup Page)

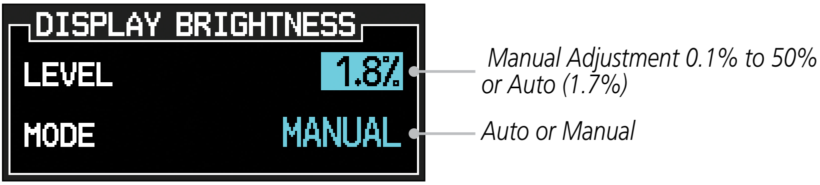
1.4.5 Display Backlighting

The backlighting of the PFD and MFD displays and bezel keys can be adjusted automatically or manually. The default setting (automatic backlighting adjustment) uses the photocell located at the top right corner of the bezel to automatically adjust for ambient lighting conditions. Photocell calibration curves are configured by the installer to optimize display appearance through a broad range of cockpit lighting conditions. Manual backlighting adjustment can be accomplished using the existing instrument panel dimmer bus or the following procedures.

Backlighting Adjustment

1) From the first AUX page, press the small **MFD** knob to highlight the "DISPLAY BRIGHTNESS" "MODE" box.

2) Turn the small **MFD** knob to select the desired brightness Level and then press **ENTER**.



DISPLAY BRIGHTNESS
LEVEL 1.8%
MODE MANUAL

Manual Adjustment 0.1% to 50% or Auto (1.7%)

Auto or Manual

Figure 1-23 Display Brightness Adjustment

3) Turn the large **MFD** knob to highlight the MODE field. Turn the small **MFD** knob to select "AUTO" or "MANUAL" and then press **ENT**.

2 PRIMARY FLIGHT DISPLAY (PFD)

Functions on the PFD are accessed by using the bezel keys on the side of the PFD and the soft keys below the PFD.

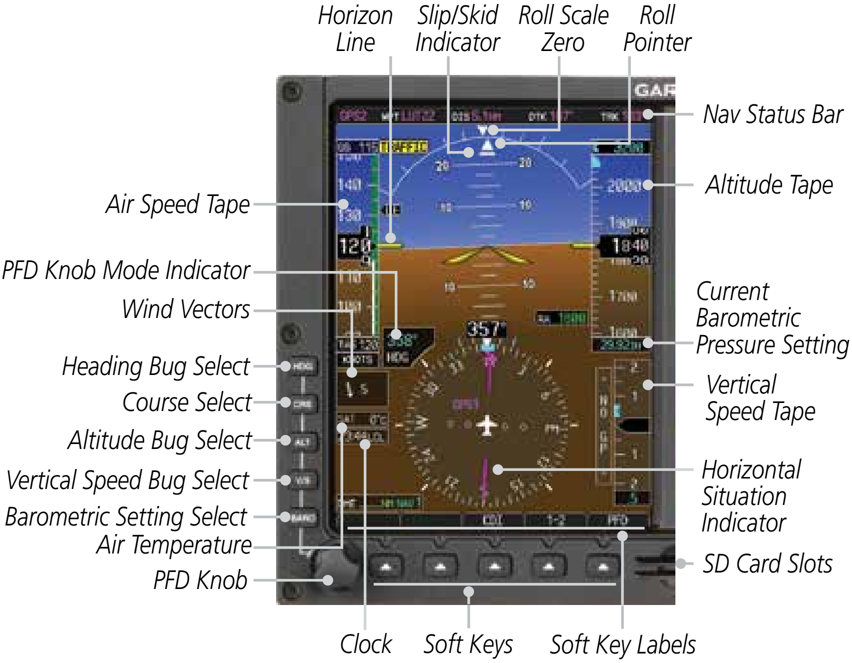

Horizon Line
Slip/Skid Indicator
Roll Scale Zero
Roll Pointer
Nav Status Bar
Altitude Tape
Air Speed Tape
PFD Knob Mode Indicator
Wind Vectors
Heading Bug Select
Course Select
Altitude Bug Select
Vertical Speed Bug Select
Barometric Setting Select
Air Temperature
PFD Knob
Current Barometric Pressure Setting
Vertical Speed Tape
Horizontal Situation Indicator
SD Card Slots
Clock
Soft Keys
Soft Key Labels

Figure 2-1 PFD Description (Ground Pointer Mode)

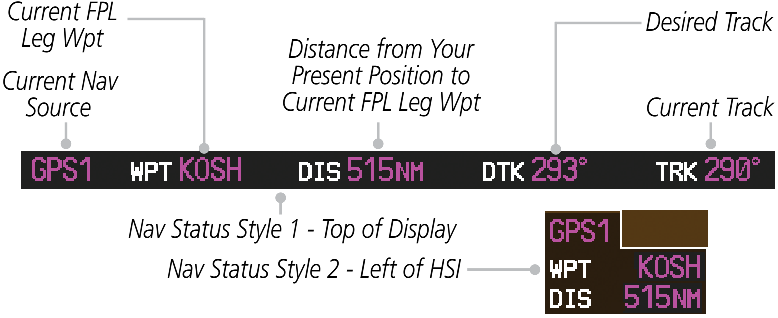

Current FPL Leg Wpt
Current Nav Source
Distance from Your Present Position to Current FPL Leg Wpt
Desired Track
Current Track
GPS1 WPT KOSH DIS 515NM DTK 293° TRK 290°
Nav Status Style 1 - Top of Display
Nav Status Style 2 - Left of HSI
GPS1
WPT KOSH
DIS 515NM

Figure 2-2 PFD Nav Status Bar Description

NOTE: *When navigating to a waypoint very far away, the DTK, CRS, and TRK values displayed on the GDU 620 may differ from those displayed on the navigator, however the CDI is correct and is the primary means of navigation. This is because the GDU 620 applies magnetic variation corrections for the current aircraft location, but some navigators apply magnetic variation correction for the waypoint location.*

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

2.1 PFD Soft Keys

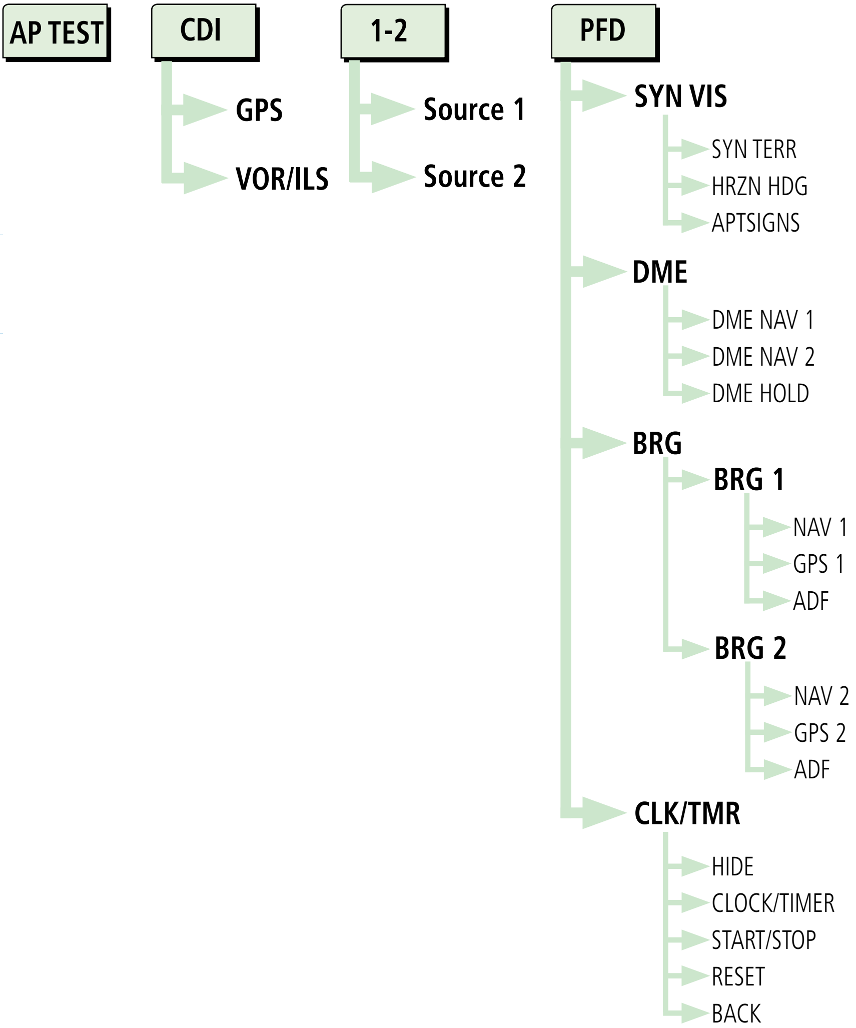

AP TEST
CDI
GPS
VOR/ILS
1-2
Source 1
Source 2
PFD
SYN VIS
SYN TERR
HRZN HDG
APTSIGNS
DME
DME NAV 1
DME NAV 2
DME HOLD
BRG
BRG 1
NAV 1
GPS 1
ADF
BRG 2
NAV 2
GPS 2
ADF
CLK/TMR
HIDE
CLOCK/TIMER
START/STOP
RESET
BACK

Figure 2-3 PFD Soft Key Diagram

The soft keys are located along the bottom of the displays below the soft key labels. The soft key labels shown depend on the soft key level or page being displayed. The soft keys can be used to select the appropriate soft key function.

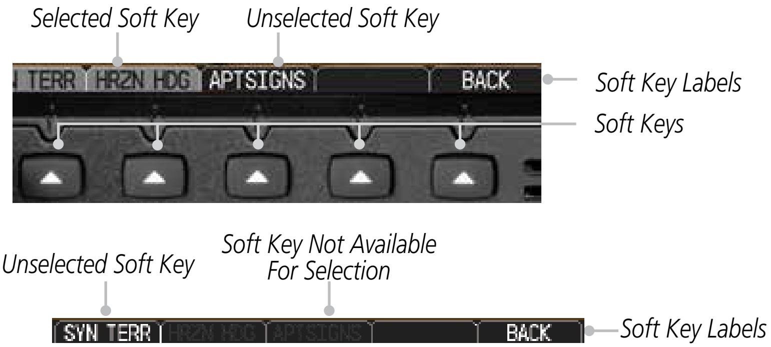

Selected Soft Key
Unselected Soft Key
TERR
HRZN HDG
APTSIGNS
BACK
Soft Key Labels
Soft Keys
Unselected Soft Key
Soft Key Not Available For Selection
SYN TERR
HRZN HDG
APTSIGNS
BACK
Soft Key Labels

Figure 2-4 PFD Soft Key Layout

When a soft key is selected, its color changes to black text on gray background and remains this way until it is turned off, at which time it reverts to white text on black background. When a soft key function is disabled, the soft key label is subdued (dimmed).

NOTE: *If a soft key is pressed and held for longer than 1 second, it is ignored.*

AP Test

The **AP TEST** soft key is available if the GAD 43 is used to provide attitude information to an autopilot. The AP TEST soft key disengages the autopilot as part of the GAD 43 test.

CDI

The **CDI** soft key toggles between the selection of GPS or VOR/LOC as the active navigation source. In a single GDU 620 system, the GDU CDI soft key will change the source in the connected navigator and making a source change in the navigator will be reflected in the GDU 620. In a dual GDU 620 system, the CDI keys in the navigator will be disabled.

1-2

The **1-2** soft key toggles between the available receivers for selected navigation source (i.e. GPS1 and GPS2 or VOR/LOC1 and VOR/LOC2). This soft key will only be present if the system is configured for a second GPS or VOR/LOC.

PFD

Pressing the **PFD** soft key displays the **SYN VIS**, **DME**, **BRG**, and **BACK** soft keys. The **DME** and **SYN VIS** soft keys will only be present if the system is configured for these features.

BRG1

The **BRG1** soft key cycles through the available bearing 1 indicator modes (NAV1, GPS1, ADF, or None).

BRG2

The **BRG2** soft key cycles through the available bearing 2 indicator modes (NAV2, GPS2, ADF, or None). This soft key will only be present if the system is configured for a second GPS or VOR/LOC.

DME

The **DME NAV** soft keys select the DME submenu. For some installations, the **DME NAV** soft keys simply toggle the DME display on/off as the submenu options will not exist. The availability of the DME controls vary based on the installation.

The **DME NAV** soft keys select NAV 1 or 2 as the DME tuning source. If this soft key is pressed again when already selected, the DME display is removed from the PFD. Not all installations will have both NAV1 and NAV2 soft keys.

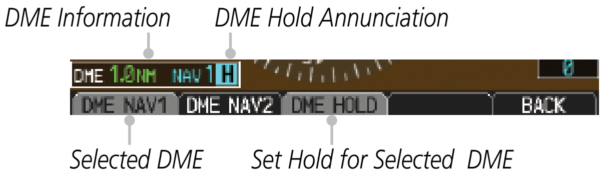


Figure 2-5 DME Soft Keys

DME HOLD

DME HOLD activates/deactivates the DME tuning hold function. DME HOLD may be selected for either DME NAV 1 or DME NAV 2. The Hold function is automatically canceled when switching between NAV1 and NAV2 tuning sources. Not all installations will have the **DME HOLD** soft key.

SYN VIS

The **SYN VIS** soft key is available if Synthetic Vision Technology™ is installed. It enables Synthetic Vision and displays the associated soft keys.

SYN TERR

The **SYN TERR** soft key is available if Synthetic Vision Technology™ is installed and enables synthetic terrain depiction.

HRZN HDG

The **HRZN HDG** soft key is available if Synthetic Vision Technology™ is installed. Pressing this key enables horizon heading marks and digits.

APTSIGNS

The **APTSIGNS** soft key is available if Synthetic Vision Technology™ is installed and enables airport sign posts.

CLK/TMR

The Clock/Timer function displays a clock or timer window in the lower left corner of the PFD.

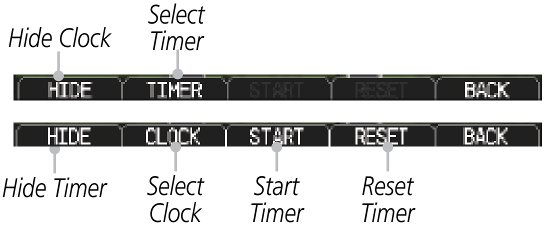


Figure 2-6 Clock and Timer Functions

BACK

The **BACK** soft key returns to the previous soft key menu.

2.2 Airspeed Indicator

The Airspeed Indicator displays airspeed on a rolling number gauge using a moving tape. The numeric labels and major tick marks on the moving tape are marked at intervals of 10 units, while minor tick marks on the moving tape are indicated at intervals of five units. Speed indication starts at 20 knots, regardless of the displayed units.

***NOTE:** Airspeed units (KTS, MPH, KPH) are configured to match the approved units for the installation.*

The Airspeed Indicator provides Indicated Airspeed, True Airspeed, and Ground Speed. The Airspeed Trend Indicator shows what the airspeed will be in six seconds, if the current acceleration is maintained. The actual airspeed is displayed inside the black pointer.

The Airspeed Trend Vector is a vertical, pink/magenta line, extending up or down on the airspeed scale, shown to the right of the color-coded speed range strip. The end of the trend vector corresponds to the predicted airspeed in six seconds if the current acceleration is maintained. If the trend vector crosses into the overspeed range, the text of the digital airspeed readout changes to yellow. The trend vector is absent if the speed remains constant or if any data needed to calculate airspeed is not available due to a system failure.

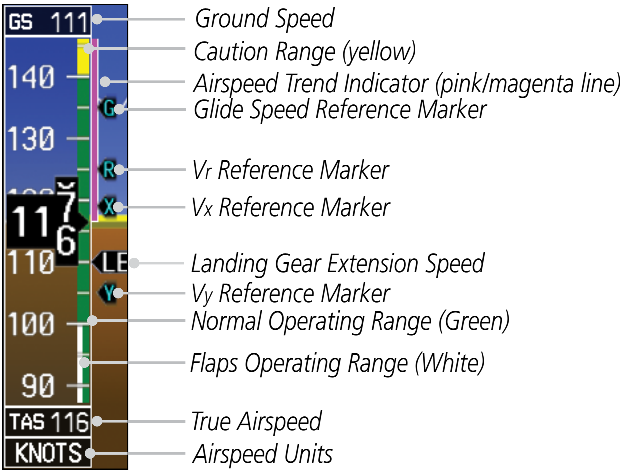

GS 111
140
130
117
116
110
LE
100
90
TAS 116
KNOTS
G
R
X
Y
Ground Speed
Caution Range (yellow)
Airspeed Trend Indicator (pink/magenta line)
Glide Speed Reference Marker
Vr Reference Marker
Vx Reference Marker
Landing Gear Extension Speed
Vy Reference Marker
Normal Operating Range (Green)
Flaps Operating Range (White)
True Airspeed
Airspeed Units

Figure 2-7 Airspeed Tape

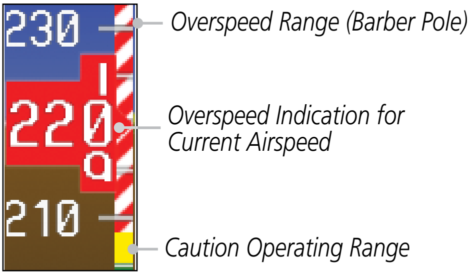

230
220
210
Overspeed Range (Barber Pole)
Overspeed Indication for Current Airspeed
Caution Operating Range

Figure 2-8 Overspeed Indication

2.2.1 Markings

A color-coded (white, green, yellow, and red/white "barber pole") speed range strip is located on the moving tape. The colors are configured to match the approved markings for the installation. See the AFM/POH.

***NOTE:** The actual colors and patterns of the airspeed tape may vary by installation. See your AFM/POH for more details.*

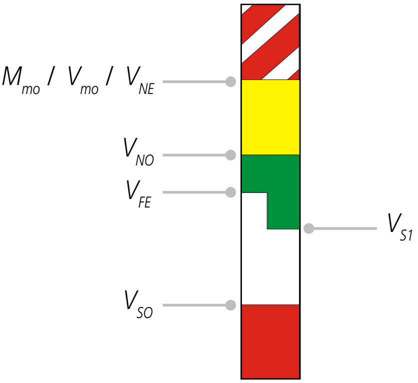


Figure 2-9 Typical Airspeed Tape Markings

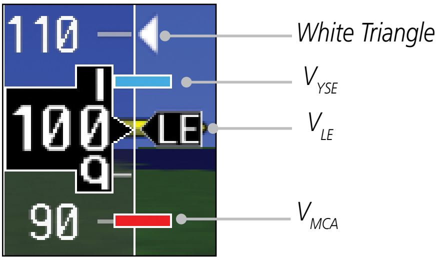


Figure 2-10 Additional Reference Markings

2.2.2 Reference Speeds

V-speeds (Glide, V_r, V_X, and V_Y) default values are set during the installation process, but can be changed and turned on/off from the System Setup page on the first page of the Aux page group. When active (on), the V-speeds are displayed at their respective locations to the right of the airspeed scale.

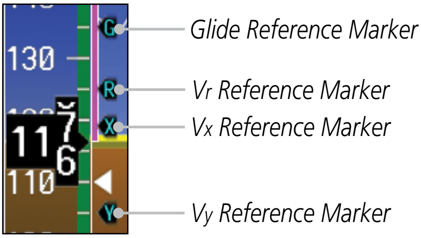

130
117
116
110
Glide Reference Marker
Vr Reference Marker
Vx Reference Marker
Vy Reference Marker

Figure 2-11 Reference Speeds

The labels for the reference markers may vary as configured during installation.

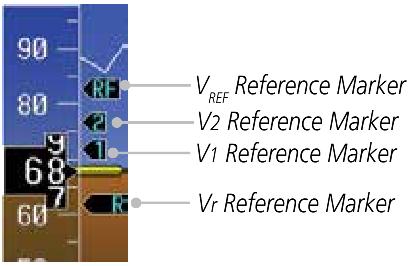
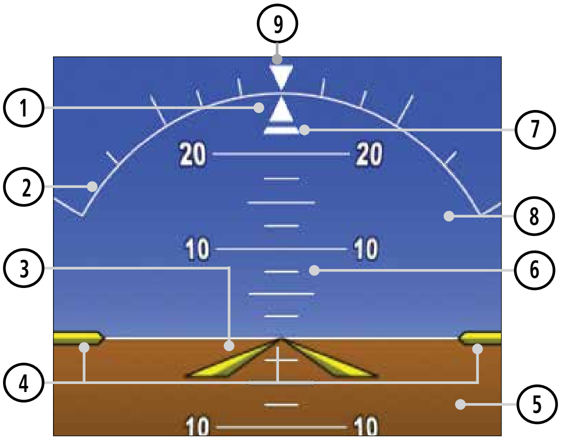

90
80
69
68
67
60
V_{REF} Reference Marker
V2 Reference Marker
V1 Reference Marker
Vr Reference Marker

Figure 2-12 Alternate Reference Speeds

2.3 Attitude Indicator

Attitude information is displayed over a virtual blue sky and brown ground with a white horizon line. The Attitude Indicator displays pitch, roll, and slip/skid information.



①	*Roll Pointer*
②	*Roll Scale*
③	*Aircraft Symbol*
④	*Horizon Line*
⑤	*Land Representation*
⑥	*Pitch Scale*
⑦	*Slip/Skid Indicator*
⑧	*Sky Representation*
⑨	*Roll Scale Zero*

Figure 2-13 Attitude Indicator

The horizon line is part of the pitch scale. Above and below the horizon line, major pitch marks and numeric labels are shown for every 10°, up to 80°. Minor pitch marks are shown for intervening 5° increments, up to 25° below and 45° above the horizon line. Between 20° below to 20° above the horizon line, minor pitch marks occur every 2.5°.

Angle of bank is indicated by the position of the pointer on the roll scale. Major tick marks are 30° and 60° and minor tick marks are 10°, 20°, and 45° are shown to the left and right of the zero.

The Slip/Skid Indicator is the bar beneath the roll pointer. The indicator moves with the roll pointer and moves laterally away from the pointer to indicate lateral acceleration. Slip/skid is indicated by the location of the bar relative to the pointer. One bar displacement (as shown below) is equal to one ball displacement on a traditional Slip/Skid Indicator.

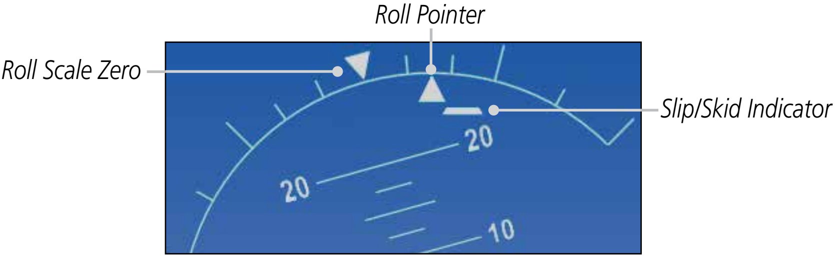


Figure 2-14 Slip/Skid Indication

The standby mechanical Attitude Indicator in your aircraft is either a Ground Pointer or a Roll Pointer configuration. The GDU 620 Attitude Indicator has been configured in either a Ground Pointer or a Roll Pointer configuration to match the configuration of your aircraft's standby Attitude Indicator. Ground/Sky Pointer mode is configured during installation and can not be changed by the pilot.

In an aircraft with an Attitude Indicator that has a Ground Pointer, the pointer above the Roll Scale shifts with the roll or bank angle of the aircraft to keep the Roll Scale Zero Pointer pointing towards the ground.

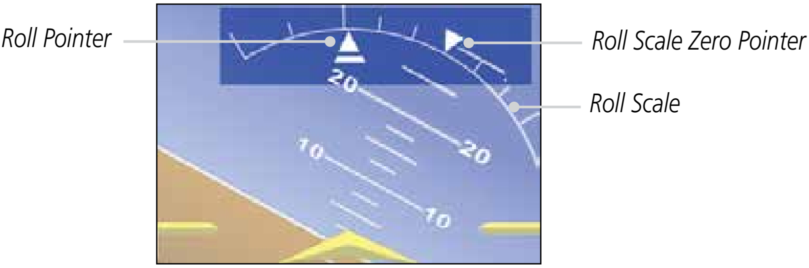


Figure 2-15 Attitude Indicator with a Ground Pointer configuration in a left turn

In an aircraft with an Attitude Indicator that has a Sky Pointer, the pointer below the roll scale shifts with the roll or bank angle of the aircraft to keep the Roll Pointer pointing towards the sky.

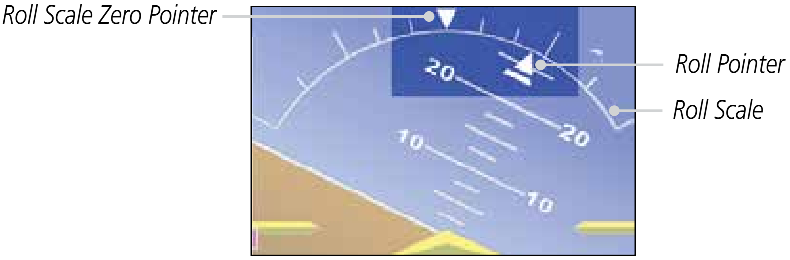


Figure 2-16 Attitude Indicator with a Sky Pointer configuration in a left turn

2.3.1 Extreme Attitude

Extreme attitude is defined as a roll greater than 65° left or right, 30° pitch up, or 20° pitch down. Red chevrons are displayed at greater than 50° pitch up and 30° pitch down. The PFD will "declutter" when the aircraft enters an extreme attitude. Only the primary functions will be displayed in these situations.

The following information is removed from the PFD (and corresponding soft keys are disabled) when the aircraft is in an unusual attitude:

- PFD Knob Mode Annunciations
- Ground Speed, True Airspeed, and Airspeed Units
- Selected Altitude, Barometer Settings, and Selected Vertical Speed
- Vertical Course Deviation Indicator
- Traffic and Terrain Annunciations
- Flight Director Command Bars
- Radar Altimeter digital readout
- Marker beacon annunciation
- Fast/Slow indicator
- DME field

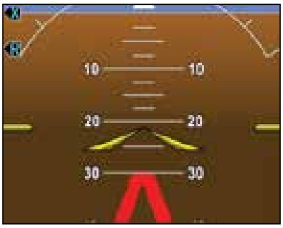


Figure 2-17 Extreme Pitch Indication

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

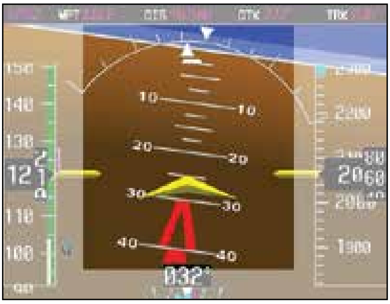

10
20
30
40
150
140
130
121
110
100
2200
2060
1900
032°

Figure 2-18 Extreme Pitch Indication Nose Down

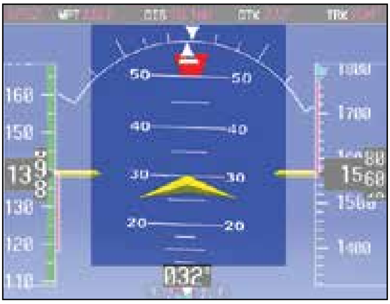

50
40
30
20
160
150
139
130
120
110
1800
1700
1560
1400
032°

Figure 2-19 Extreme Pitch Indication Nose Up

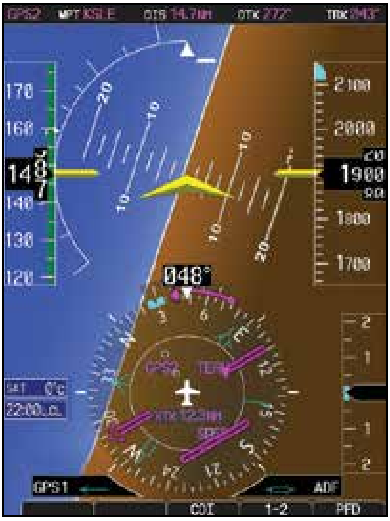

GPS2
WPT KSLE
DIS 14.7NM
DTK 272°
TRK 243°
170
160
148
140
130
120
2100
2000
1900
1800
1700
048°
SAT 0°C
22:00 LCL
GPS1
ADF
CDI
1-2
PFD

Figure 2-20 Extreme Roll Indication with Display Declutter

2.4 Altimeter

The altimeter displays the current altitude, altitude trend, altitude bug setting, altitude bug, and the current BARO setting.

The Altitude Trend Vector is a vertical, magenta line, extending up or down on the left side of the Altitude scale. The end of the trend vector corresponds to the predicted altitude in six seconds if the current vertical speed is maintained.

The Altitude Bug is displayed at the selected Altitude Bug setting. A portion of the Altitude Bug will be displayed at the top or the bottom of the altitude tape if the selected Altitude Bug is off of the tape.

When an optional Radar Altimeter is installed, the altitude received from the radar altitude will be displayed on the PFD. See the Radar Altimeter section for more details.

2.4.1 Setting the Altitude Bug and Alerter

1) Press the **ALT** key to activate Altitude mode.

2) Turn the **PFD** knob to move the Altitude Bug to a desired altitude.

OR

3) Press the center of the **PFD** knob to set the selected altitude to the current altitude.

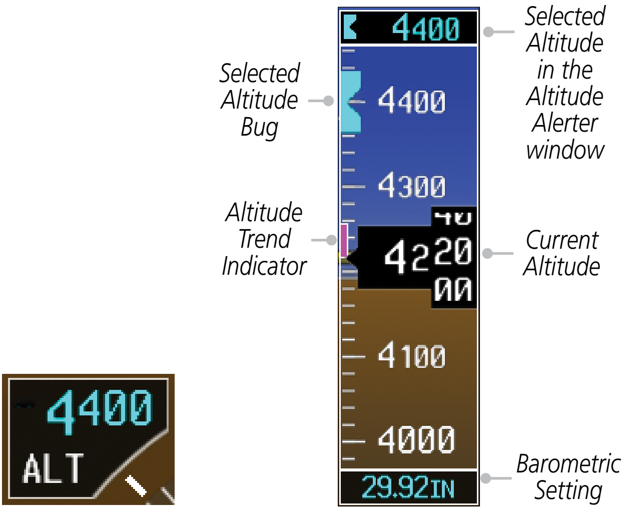

4400
ALT
Selected Altitude Bug
Altitude Trend Indicator
4400
4400
4300
4220
4100
4000
29.92IN
Selected Altitude in the Altitude Alerter window
Current Altitude
Barometric Setting

Figure 2-21 Altimeter

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

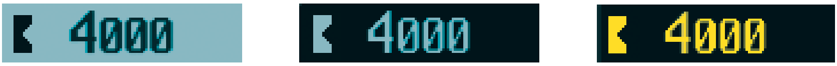
2.4.2 Altitude Alerting

The Altitude Alerting function provides the pilot with visual and aural alerts (if interfaced to an audio panel) when approaching the Selected Altitude. Whenever the Selected Altitude is changed, the Altitude Alerter is reset.

NOTE: *The Altitude Alerter function may be disabled in some installations. When the Altitude Alerter is disabled, pressing the **ALT** key will result in an "ALT KEY INOP" message.*

The following occur when approaching the Selected Altitude:

- Upon passing through 1000 feet of the Selected Altitude, the Selected Altitude (shown above the Altimeter) changes to black text on a light blue background, and flashes for five seconds. An audio alert may be generated, if configured.
- When the aircraft passes within 200 feet of the Selected Altitude, the Selected Altitude changes to light blue text on a black background and flashes for five seconds and an aural tone may be generated, if configured.
- After reaching the Selected Altitude, if the pilot flies outside the deviation band (beyond ±200 feet of the Selected Altitude), the Selected Altitude changes to yellow text on a black background, flashes for five seconds, and an aural tone is generated.



Within 1000 ft *Within 200 ft* *Deviation of ±200 ft*

Figure 2-22 Altitude Alerting Visual Annunciations

NOTE: *The aural tone when approaching the selected altitude may be configured at installation for either 200 feet or 1000 feet. The tone when deviating from the selected altitude always occurs at 200 feet.*

2.4.3 Changing Barometric Setting

The Barometric Setting affects the altitude values shown on the PFD. Barometric pressure units may be displayed as either inches (in) or hectopascals (hpa). See *System Display Units* in Section 3 for more detail.

1) Press the **BARO** key to activate Baro mode.
2) Turn the **PFD** knob to increase or decrease the altimeter setting. OR

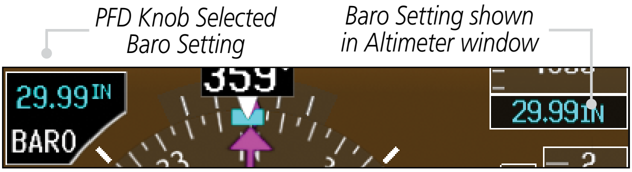

PFD Knob Selected Baro Setting
Baro Setting shown in Altimeter window
29.99IN
BARO
359°
29.99IN

Figure 2-23 Barometric Setting

3) Press the **PFD** knob while in Baro mode to toggle between Standard Pressure (29.92 in) and the currently selected barometric setting.

2.4.4 Minimum Descent Altitude/Decision Height Alerting

For altitude awareness, a Minimum Descent Altitude (MDA) alert can be displayed on the PFD. The values are set in the Active Flight Plan page or from the Charts page menu. When active, the minimum descent altitude setting is displayed in the minimums window at the bottom left of the Altitude Tape when you are within 2500 feet of the selected altitude.

***NOTE**: The Altitude Minimums Alerting Bug appears parked at the bottom of the altitude tape as soon as a value is set in the minimums alerter. The bug will unpark and start to move up the tape as soon as the altitude is within the range of the tape. The bug is reset when power is cycled.*

The following visual annunciations occur when approaching the MDA/DH:

- When the aircraft altitude descends to within 2500 feet of the selected altitude setting, the Minimums box appears with the altitude value in cyan text. Once in range, the Altitude Minimums Bug appears in cyan on the altitude tape.
- When the aircraft is within 100 feet of the selected altitude setting, the bug and text turn white.
- Once the aircraft reaches the selected altitude minimums setting, the bug and the altitude text turn yellow and the aural alert “Minimums, minimums,” is heard one time. The text remains in yellow until the aircraft altitude is more than 50 feet above the set altitude minimum value.

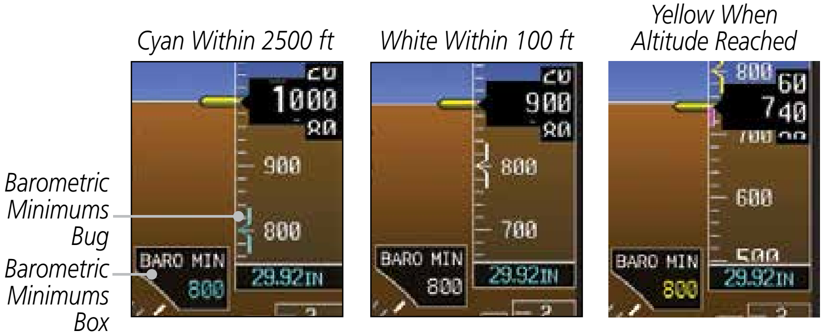

Cyan Within 2500 ft
White Within 100 ft
Yellow When Altitude Reached
Barometric Minimums Bug
Barometric Minimums Box
1000
900
800
BARO MIN
800
29.92IN
900
800
700
BARO MIN
800
29.92IN
800
740
600
500
BARO MIN
800
29.92IN

Figure 2-24 Barometric MDA/DH Alerting Visual Annunciations

Alerting is inhibited while the aircraft is on the ground and until the aircraft reaches 150 feet above the selected Minimum Altitude. Normally the altitude alerter only allows selection of altitudes in 100 foot increments. When a value other than 100 feet is set for Baro Mins, it becomes a selectable value in the altitude alerter.

In dual installations, the minimums alerting altitude value may be set from either GDU 620 and will be synchronized on both units.

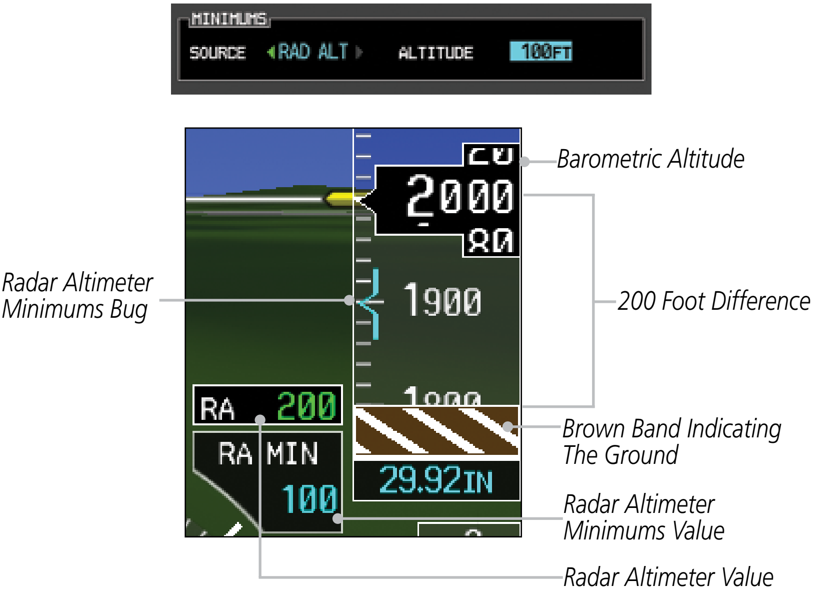
Setting the Altitude Minimums Bug is performed on either the FPL - Active Flight Plan page or the FPL - Charts page.

For details for setting the Altitude Minimums Bug on the Active Flight Plan page, refer to Section 3 - MFD - Flight Plan Pages.

For details for setting the Altitude Minimums Bug on the Charts page, refer to Section 5 - Additional Features - Charts Menu Selections.

Radar Altimeter Minimums

When a radar altimeter is installed and configured, the pilot has the option to select either Radar Altimeter (RAD ALT) or Barometric Altitude (BARO) Minimums. Radar Altimeter Minimums behave the same (coloring and operation) as the Barometric Minimums except that Baro Minimums are based on barometric altitude, while the Radar Altimeter Minimums reflect distance above the ground. For instance, while the Baro Minimums bug may remain constant where in the same situation the Radar Altimeter value could move up and down due to terrain.



MINIMUMS

SOURCE ◂RAD ALT▸ ALTITUDE 100FT

Barometric Altitude
Radar Altimeter Minimums Bug
200 Foot Difference
Brown Band Indicating The Ground
Radar Altimeter Minimums Value
Radar Altimeter Value
2000
1900
RA 200
RA MIN 100
29.92IN

Figure 2-25 Minimums Values with a Radar Altimeter

2.5 Vertical Speed (V/S) Indicator

Vertical speed data is presented on the bottom right of the PFD. A Vertical Speed bug and a bug setting are also available.

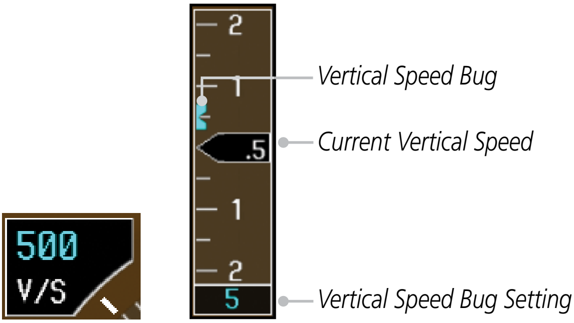


Figure 2-26 Vertical Speed (V/S) Tape and Window

The Vertical Speed Indicator displays the aircraft vertical speed using a non-moving tape. The tape can be scaled at ±2000, ±3000, or ±4000 fpm as set by the installer. Major gradations are every 1000 fpm and minor gradations every 500 fpm. The current vertical speed is displayed in the pointer along the tape. Digits appear in the pointer when the climb or descent rate is greater than 100 fpm. If the rate of ascent/descent exceeds the vertical speed displayed on the tape, the pointer appears at the corresponding edge of the tape and the rate appears inside the pointer. The Vertical Speed Indicator range determines the airspeed tape range.

VSI (set by installer)	Airspeed Tape Range
±2000 fpm	60 kts
±3000 fpm	70 kts
±4000 fpm	80 kts

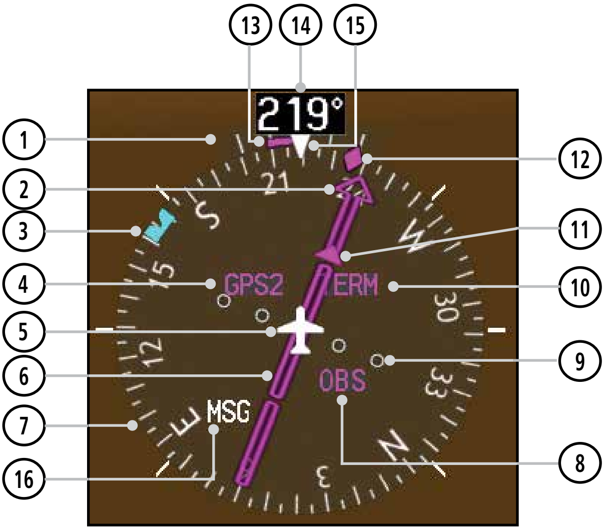
Table 2-1 Vertical Speed Settings

Setting the Vertical Speed Indicator Bug

1) Press the **V/S** key to activate Vertical Speed mode.
2) Turn the **PFD** knob to change the Vertical Speed Bug.
3) Press the center of the **PFD** knob to set the Vertical Speed value to the current vertical speed.

2.6 Horizontal Situational Indicator

The Horizontal Situation Indicator (HSI) displays a rotating compass card in a heading-up orientation. Letters indicate the cardinal points and numeric labels occur every 30º. Major tick marks are at 10º intervals and minor tick marks at 5º intervals. A digital reading of the current heading appears on top of the HSI, and the current ground track is represented on the HSI by a magenta diamond. The HSI also presents turn rate, course deviation, bearing, and navigation source information. The "MSG" annunciation will be shown in the HSI when an unacknowledged message is present on the selected navigator. When the message is acknowledged, the "MSG" annunciation will clear.



- ① *Turn Rate Indicator*
- ② *Course Pointer*
- ③ *Heading Bug*
- ④ *Navigation Source*
- ⑤ *Aircraft Symbol*
- ⑥ *Course Deviation Indicator (CDI)*
- ⑦ *Rotating Compass Card*
- ⑧ *OBS Mode Active*
- ⑨ *Lateral Deviation Scale*
- ⑩ *GPS Level of Service*
- ⑪ *To/From Indicator*
- ⑫ *Current Track Indicator*
- ⑬ *Turn Rate/Heading Trend Vector*
- ⑭ *Current Heading*
- ⑮ *Lubber Line*
- ⑯ *MSG (Message) on Navigator*

Figure 2-27 Horizontal Situation Indicator (HSI)

The 360° HSI contains a Course Deviation Indicator (CDI), with a Course Pointer, To/From Indicator, and a sliding deviation bar and scale. The course pointer is a single line arrow (GPS1, VOR1, and LOC1) or a double line arrow (GPS2, VOR2, and LOC2) which points in the direction of the set course. "LOC" will automatically be displayed if a localizer frequency is tuned. The To/From arrow rotates with the course pointer and is displayed when the active NAVAID is received.

2.6.1 Setting the Heading Bug

The Selected Heading is shown to the upper left of the HSI for 10 seconds after being adjusted. The light blue bug on the compass rose corresponds to the Selected Heading.

***NOTE:** The current heading will have a "T" to the right of the heading value when the Nav Angle is set to True in the System Setup page of the Aux page group.*

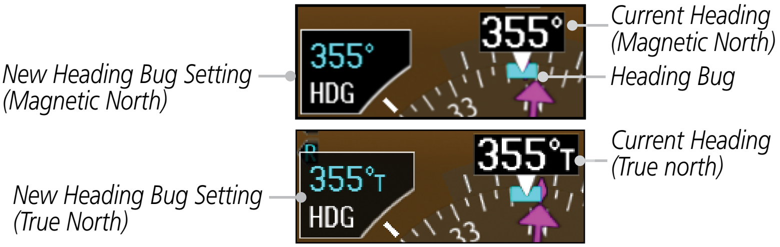

Current Heading (Magnetic North)
355°
355°
HDG
New Heading Bug Setting (Magnetic North)
Heading Bug
33
Current Heading (True north)
355°T
355°T
HDG
New Heading Bug Setting (True North)
33

Figure 2-28 Heading Bug Setting

1) Press the **HDG** key to activate HDG mode.

2) Turn the **PFD** knob to change the Heading Bug.

OR

3) Press the **PFD** knob in HDG mode to set the Heading Bug to the current heading.

2.6.2 Turn Rate Indicator

The Turn Rate Indicator is located directly above the rotating compass card. Tick marks to the left and right of the lubber line denote half-standard and standard turn rates. A magenta Turn Rate Trend Vector shows the current turn rate. The end of the trend vector gives the heading predicted in six seconds, based on the present turn rate. A standard-rate turn is shown on the indicator by the trend vector stopping at the standard turn rate tick mark, corresponding to a predicted heading of 18° from the current heading. At rates greater than four deg/sec, an arrowhead appears at the end of the magenta trend vector and the prediction is no longer valid.

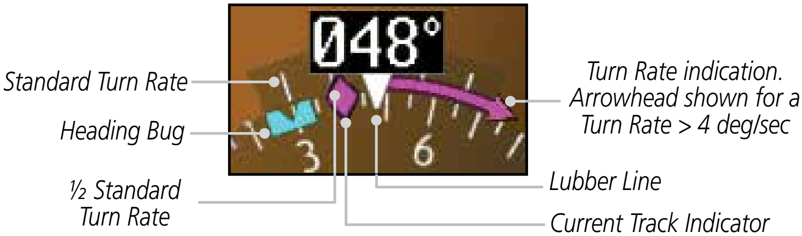

048°
3
6
Standard Turn Rate
Heading Bug
½ Standard Turn Rate
Turn Rate indication. Arrowhead shown for a Turn Rate > 4 deg/sec
Lubber Line
Current Track Indicator

Figure 2-29 Turn Rate Indicator and Trend Vector

2.7 Course Deviation Indicator

The Course Deviation Indicator (CDI) moves left or right from the course pointer along a lateral deviation scale to display aircraft position relative to the course. If the course deviation data is not valid, the CDI is not displayed.

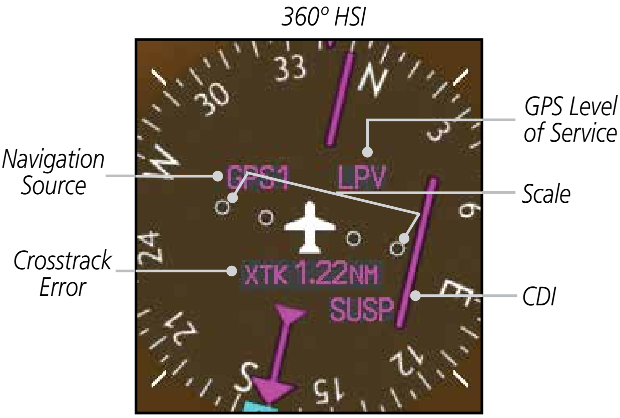

360° HSI
33
N
30
3
W
GPS1
LPV
6
24
XTK 1.22NM
SUSP
E
21
S
15
12
Navigation Source
Crosstrack Error
GPS Level of Service
Scale
CDI

Figure 2-30 Course Deviation Indicator

NOTE: *The ILS Localizer and Glideslope deviation indicators will indicate full-scale deflection for the GNS 480 navigator at the second dot. The GNS 400W/500W series navigators will indicate full-scale deflection at the edge of the display.*

2.7.1 Changing CDI Sources

The CDI can display two sources of navigation: GPS or NAV (VOR, and LOC). Color indicates the current navigation source: magenta (for GPS) or green (for VOR and LOC). The full-scale limits for the CDI are defined by a GPS-derived distance when coupled to GPS. When coupled to a VOR or localizer (LOC), the CDI has the same angular limits as a mechanical CDI. If the CDI exceeds the maximum deviation on the scale (two dots) while coupled to GPS, the crosstrack error (XTK) is displayed below the white aircraft symbol.

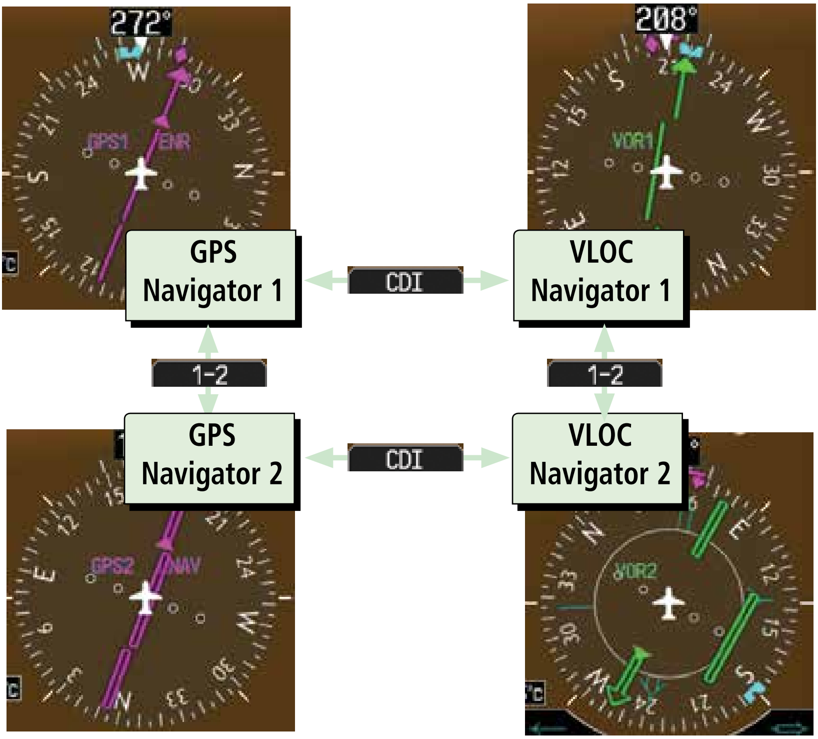


Figure 2-31 CDI Navigation Sources

1) Press the **CDI** soft key to toggle between GPS and VOR/LOC source type.

2) Press **1-2** soft key to toggle between the 1 and 2 navigators of the GPS or VOR/LOC sources.

3) Verify the navigation source by the indication on the HSI and in the upper left corner of the PFD.

***NOTE**: The selected navigator is the active navigator for all PFD and MFD operations, except for the supplemental bearing pointers.*

2.7.2 Changing CDI Course

The Selected Course is shown to the upper left of the HSI for 10 seconds after being adjusted.

New Course Setting

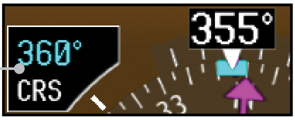


Figure 2-32 Course Setting

1) Press the **CRS** key to activate Course mode.

2) Turn the **PFD** knob to change the Course values.

OR

3) Press the **PFD** knob to set a Course that will center the CDI to the VOR station or waypoint if in GPS OBS mode.

2.7.3 Vertical Deviation Indicator (VDI)

The Vertical Deviation (Glideslope) Indicator (VDI) appears to the left of the VSI whenever an ILS frequency is tuned in the active NAV field. A green diamond acts as the VDI Indicator, like a glideslope needle on a conventional indicator. If a localizer frequency is tuned and there is no glideslope signal, "NO GS" is annunciated. The glideslope on an ILS approach is only shown if the current heading is within 90° of the selected inbound course. This prevents the glideslope from being displayed during localizer backcourse approaches.

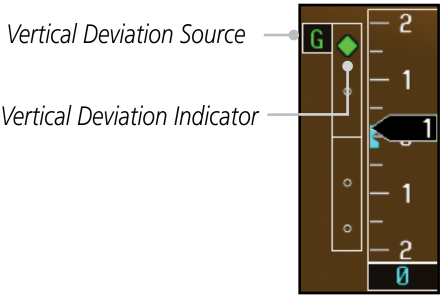


Figure 2-33 Vertical Deviation Indicator (ILS Source)

The vertical deviation is similar to the glideslope for GPS approaches supporting WAAS vertical guidance (LNAV+V, L/VNAV, LPV, LP+V). When an approach of this type is loaded into the flight plan and GPS is the selected navigation source, the Vertical Deviation Indicator appears as a magenta diamond. If the approach type downgrades to LNAV past the final approach fix (FAF), or the approach only supports LNAV service, "NO GP" is annunciated.

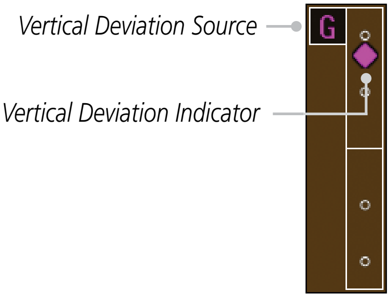


Figure 2-34 Vertical Deviation Indicator (GPS Source)

2.7.4 Auto-Slewing

The G500/600 system is designed to interface with GPS navigator units and also manage up to four different CDI course pointers (GPS1, NAV1, GPS2, NAV2) independently. The G500/600 will automatically slew the NAV course pointer to the correct final approach course when a ILS, LOC, LOC BC, LDA or SDF approach is active in the GPS navigator and the appropriate frequency is in the active window in the navigator. The G500/600 will Auto-Slew the HSI course pointer for an ILS, LOC, LOC BC, LDA, or SDF approach when the steps below are completed in the following order:

1) The desired approach is selected and activated in the navigator (this can be verified by the approach waypoints appearing on the GDU 620 MFD Nav Map Page or FPL Page).

2) The appropriate frequency is the active frequency in the navigator.

3) The CDI selection on the GDU 620 is changed to NAV course pointer for the active navigator.

NOTE: *If the NAV course pointer is displayed for the active navigator when the approach is activated and the localizer frequency is tuned, the pilot will need to switch to another CDI source and then back to NAV for the course pointer to Auto-Slew.*

For example, if NAV1 is currently selected, the pilot must:
press the CDI soft key twice: NAV1>GPS1>NAV1
OR
press the 1-2 soft key twice: NAV1>NAV2>NAV1

NOTE: *For LOC BC approaches, the course pointer will slew 180 degrees from the inbound course.*

Example of activating Auto-Slewing in the G500/600:

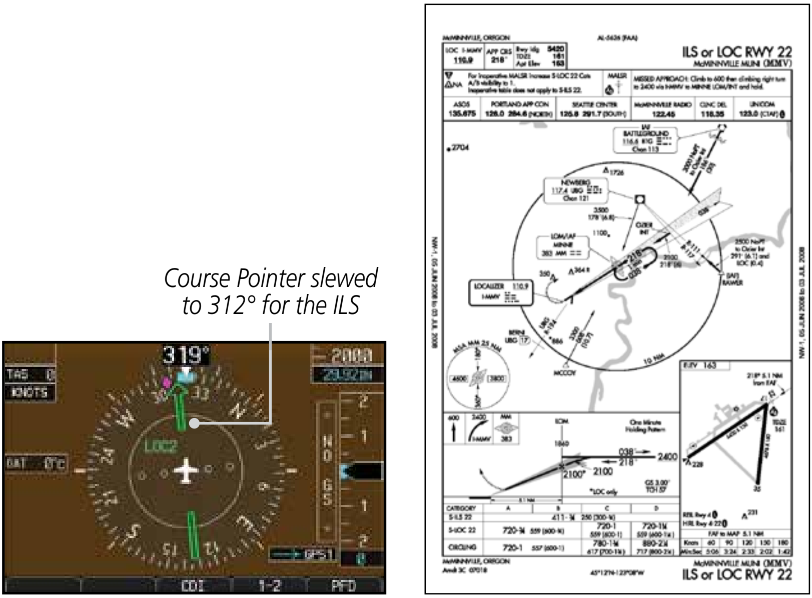
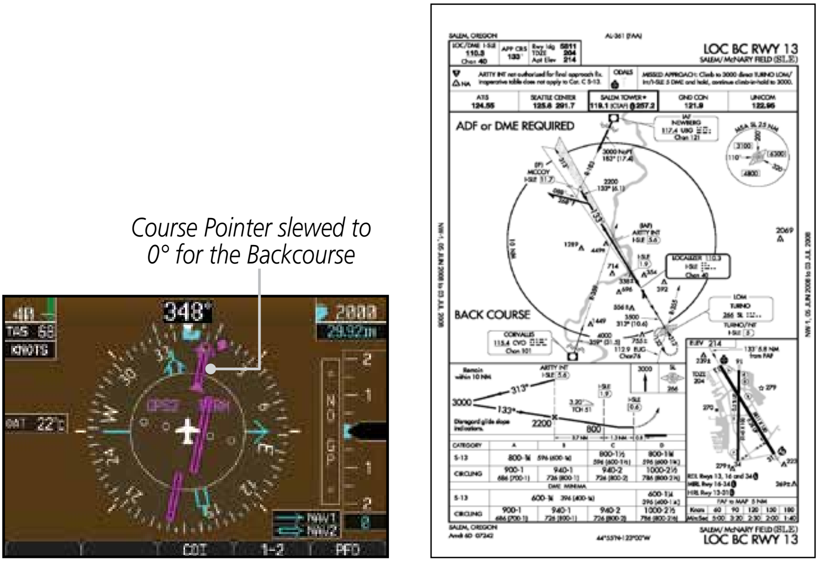

Course Pointer slewed to 312° for the ILS

Figure 2-35 Auto-Slewing HSI with ILS Loaded and Shown with the Corresponding Approach Plate

1) The aircraft is flying vectors to final on an active ILS approach, with the appropriate approach in the GPS navigator.
2) The appropriate ILS frequency must be activate in the navigator.
3) Verify that the waypoints for the approach are displayed on the Nav Map Page or the FPL Page of the MFD.
4) Upon approaching the final course, select LOC on the HSI.

NOTE: *If auto CDI switching is active on the GPS unit, the GPS will force the GPS/GDU 620 to NAV when the aircraft is close to the LOC course.*

5) The CDI and course pointer will change from magenta to green and the pointer will move, or slew, to the final approach course (or 180° from the final approach course for LOC BC approaches).


Course Pointer slewed to 0° for the Backcourse

348°
TAS 68
KNOTS
OAT 22°C
2000
29.92IN
NAV1
NAV2
CDI
1-2
PFD
LOC BC RWY 13
SALEM/McNARY FIELD (SLE)
ADF or DME REQUIRED
BACK COURSE
SALEM, OREGON

Figure 2-36 Auto-Slewing HSI with Localizer Backcourse Loaded and Shown with the Corresponding Approach Plate

2.8 Supplemental Flight Data

2.8.1 Bearing Pointers

Two Bearing Pointers can be displayed on the HSI for NAV and GPS sources. The pointers are light blue and are single- (BRG1) or double-lined (BRG2); an icon is shown in the respective information window to indicate the pointer type. The system must be configured for a second navigation source to show the BRG2 selection.

When a Bearing Pointer is displayed, its associated information window is also displayed.

The Bearing Information windows are displayed to the lower sides of the HSI and show:

- Bearing source (GPS, NAV, or ADF)
- Pointer icon (BRG1 = single line, BRG2 = double line)

The Bearing Pointer is removed from the HSI if:

- The NAV radio is not receiving the tuned VOR station
- The NAV radio is tuned to a Localizer frequency

- GPS is the bearing source and an active waypoint is not selected
- ADF is selected and a signal is not received (if you have an ADF that supports a valid flag then the bearing pointer will be removed. If your ADF system does not include a valid flag then the bearing pointer will still be displayed, regardless of ADF signal validity.)

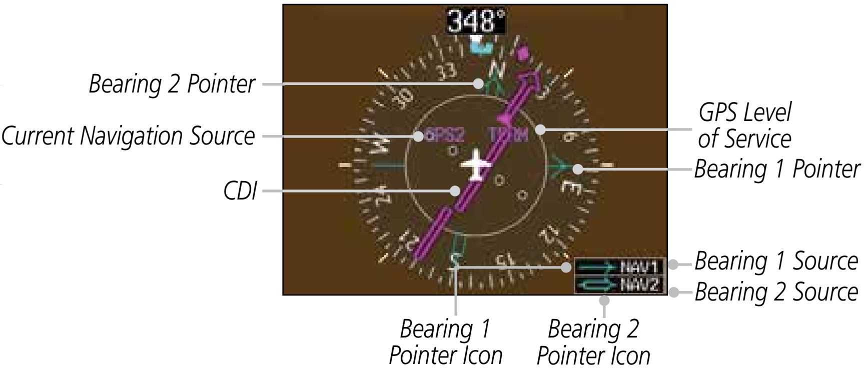

348°
Bearing 2 Pointer
Current Navigation Source
CDI
GPS Level of Service
Bearing 1 Pointer
Bearing 1 Source
Bearing 2 Source
Bearing 1 Pointer Icon
Bearing 2 Pointer Icon
GPS2
TERM
NAV1
NAV2

Figure 2-37 HSI with Bearing Information

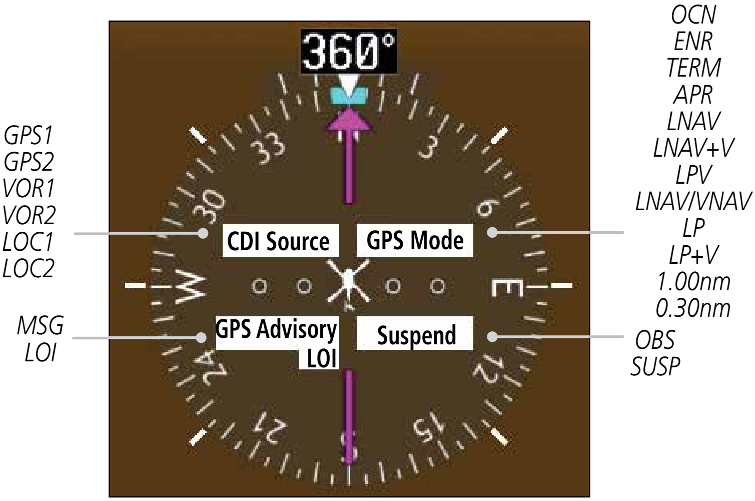

360°
CDI Source
GPS Mode
GPS Advisory
LOI
Suspend
GPS1
GPS2
VOR1
VOR2
LOC1
LOC2
MSG
LOI
OCN
ENR
TERM
APR
LNAV
LNAV+V
LPV
LNAV/VNAV
LP
LP+V
1.00nm
0.30nm
OBS
SUSP

Figure 2-38 PFD HSI Annunciations

1) Press the **PFD** soft key to display the navigation source keys.

2) Press the **BRG 1** or **BRG 2** soft keys to toggle between the available Nav receivers of the selected source (such as: GPS, NAV, or ADF).

***NOTE:** The Bearing Line for navigation source 1 (BRG1) will be a single line. The Bearing Line for navigation source 2 (BRG2) will be a double line.*

2.8.2 Temperature Display

The outside air temperature is displayed to the left of the HSI. The air data computer calculates the temperature based on temperature probe and pitot/static inputs. The units (°C or °F) and temperature reference are selected on the AUX – SYSTEM SETUP page. The temperature reference can be selected to one of the following choices:

- Static Air Temperature (SAT) – This is the calculated temperature of the stationary (static) outside air. Conceptually, this is the temperature that would be read on a thermometer floating stationary at the current location.
- Total Air Temperature (TAT) – This is the calculated temperature of the outside air as it moves past the aircraft, including the rise in temperature due to air compression and friction at the current airspeed.
- Difference from International Standard Atmosphere (ISA) – This is the difference between SAT and standard (ISA) temperature at the current altitude. This provides an indication of how much warmer/colder the temperature is from a "standard" atmosphere.

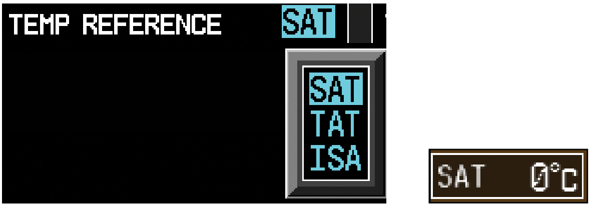


Figure 2-39 Outside Air Temperature Selection

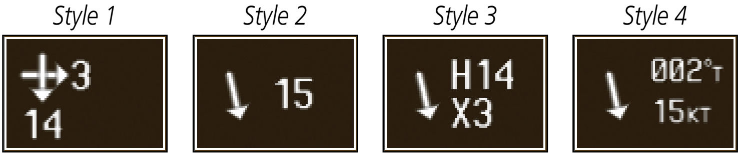
2.8.3 Wind Vectors

When selected, wind vector information is displayed in a window on the PFD to the left of the HSI. The Wind Vector style is configured in the Aux Mode System Setup page. While on the ground, the Wind Vector window will indicate "No Wind Data."

NO WIND
DATA

Figure 2-40 Wind Vector with No Wind Data

Four styles are available as shown below.



Style 1 *Style 2* *Style 3* *Style 4*

Figure 2-41 Wind Vector Style

2.8.4 DME Indication

When selected, DME information is displayed in a window in the lower left corner of the PFD. The distance to the station and the Nav source used are shown.

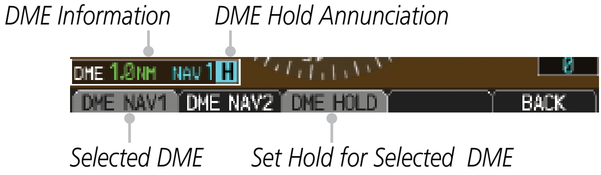

DME Information
DME Hold Annunciation
DME 1.0NM NAV1 H
DME NAV1
DME NAV2
DME HOLD
BACK
Selected DME
Set Hold for Selected DME

Figure 2-42 DME Indication

> ***NOTE:*** *The capability of providing DME information requires installation of the GAD 43e.*

2.8.5 Marker Beacon Annunciations

A visual annunciation of marker beacons will be shown on the display when the aircraft flies over a marker beacon. The marker beacon annunciation will appear to the left of the altitude tape below the terrain annunciator on the PFD.

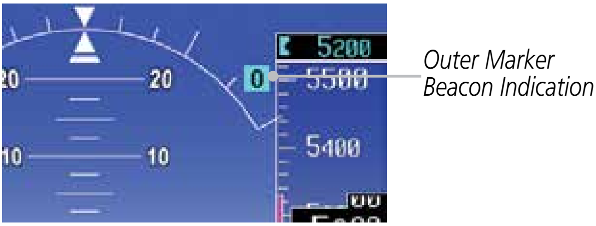

5200
20
20
O
5500
10
10
5400
Outer Marker
Beacon Indication

Figure 2-43 Marker Beacon Location

Current Beacon	Icon (Standard)	Icon (Blink)
Inner Marker	I	I
Middle Marker	M	M
Outer Marker	O	O

Table 2-2 Marker Beacons

2.8.6 Miscompare Annunciations

Miscompare annunciations are capable of being displayed on the PFD if the miscompare Monitor is enabled during the installation configuration.

Messages will appear in the MFD alerts window if monitors are enabled and required data is not present.

A miscompare condition is triggered if the difference between the data reported by GDU 1 and GDU 2 exceeds the threshold described in the following table for at least one second:

Parameter	Range of Trigger	Threshold
Altitude	ALL	200 feet
Indicated Airspeed	Both IAS < 35 kts	Inhibited
Indicated Airspeed	Either IAS >= 35 kts	10 kts
Indicated Airspeed	Either IAS >= 80 kts	7 kts
Pitch	ALL	5 degrees
Roll	ALL	6 degrees

Table 2-3 Miscompare Conditions

A “MISCOMP” annunciation is displayed on the airspeed tape if a miscompare condition exists for indicated airspeed. A “MISCOMP” annunciation is displayed on the altitude tape if a miscompare condition exists for altitude. A “PITCH MISCOMP” annunciation is displayed over the pitch ladder if a miscompare condition exists for pitch and not roll. A “ROLL MISCOMP” annunciation is displayed over the pitch ladder if a miscompare condition exists for roll and not pitch. An “ATTITUDE MISCOMP” annunciation is displayed over the pitch ladder if a miscompare condition exists for both pitch and roll.

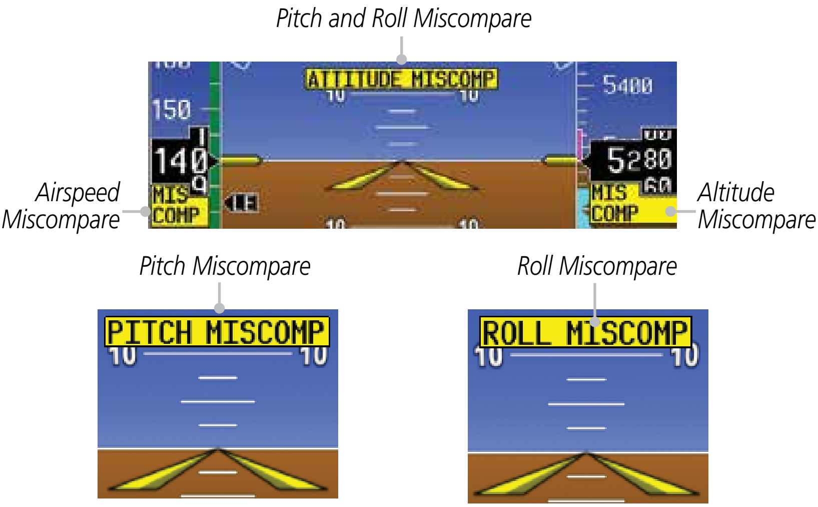

Pitch and Roll Miscompare
ATTITUDE MISCOMP
150
140
MIS COMP
5400
5280
MIS COMP
Airspeed Miscompare
Altitude Miscompare
Pitch Miscompare
Roll Miscompare
PITCH MISCOMP
ROLL MISCOMP

Figure 2-44 Miscompare Annunciations

2.9 Radar Altimeter

When an optional Radar Altimeter is installed, the altitude received from the radar altitude will be displayed on the PFD.

NOTE: See the Radar Altimeter documentation for details on the radar altimeter performance and limitations.

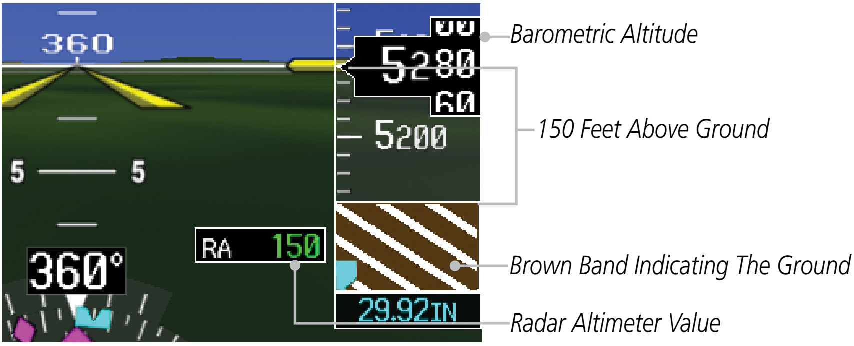
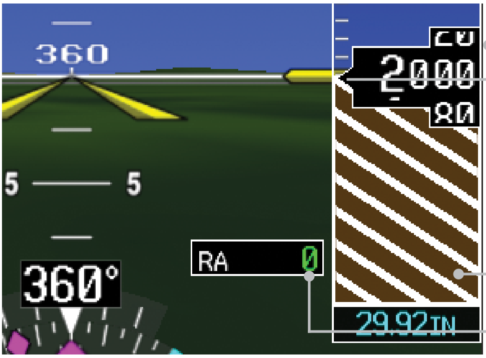

360
5
5
360°
RA 150
5280
5200
29.92IN
Barometric Altitude
150 Feet Above Ground
Brown Band Indicating The Ground
Radar Altimeter Value

Figure 2-45 Radar Altimeter Display - 150 foot RA Altitude

When the radar altitude is 0, the brown band will be level with the altitude tape pointer. As the radar altitude increases above 0, the brown band will move down the tape in an amount equal to the current radar altitude.



Barometric Altitude

0 Foot Difference (On Ground)

Brown Band Indicating The Ground

Radar Altimeter Value

Figure 2-46 Radar Altimeter Display - 0 foot RA Altitude

The Radar Altimeter self-test process will be annunciated on the PFD above the Radar Altimeter altitude value. The self-test is a wiring test to indicate communication between the GDU and the Radar Altimeter. The self-test will be cancelled after 15 seconds, the Test key is pressed again, or you leave the System Setup page.

NOTE: *Not all Radar Altimeters have the TEST function.*

---

1) Turn the large **MFD** knob to Aux mode and then turn the small **MFD** knob to the System Setup page.

2) Press the **RA TEST** soft key. "RA TEST" will be annunciated above the Radar Altimeter value. The Radar Altimeter value will show a certain number to indicate that communication is taking place between the Radar Altimeter and the GDU. See your Radar Altimeter documentation for the appropriate value.

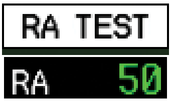


Figure 2-47 Radar Altimeter Test Annunciation

3) Press the **RA TEST** key again to stop the self-test.

4) If the unit fails the self-test, the RA value will not match the expected value. The "RA FAIL" annunciation will appear on the PFD when the GDU is not receiving any Radar Altimeter data. "RA FAIL" is not related to the self-test.

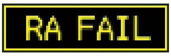


Figure 2-48 Radar Altimeter Failure Annunciation

2.10 Fast/Slow Indication

The Fast/Slow indication as provided from an external system is shown on the left side of the PFD along the horizon line. See your AFM for details on operation.

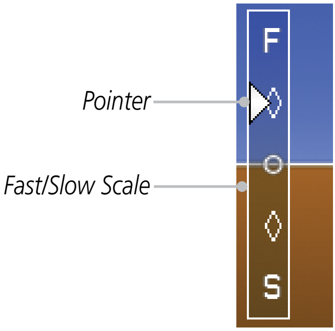


Figure 2-49 Fast/Slow Scale and Pointer

2.11 PFD Display Units

The PFD display units may be set to standard or metric units by the installer. The MFD display units may still be selected by the user in the System Setup page of Aux mode.

3 MULTI-FUNCTION DISPLAY (MFD)

The MFD displays a color moving map with navigation information. Moving map information is shown on the two Navigation Map pages and the optional Weather (WX) pages. The Navigation Map displays aviation data (e.g., airports, VORs, airways, airspaces), geographic data (e.g., cities, lake, highways, borders), topographic data (map shading indicating elevation), and hazard data (e.g., traffic, terrain, weather). The map options set for Navigation Map page 1 are used as the default settings for the optional Weather (WX) pages. Which data is displayed can be controlled by the DCLTR soft key and map page MENU selections. The Navigation Map can be oriented four different ways: North Up (NORTH UP), Track Up (TRACK UP), Desired Track Up (DTK UP), or Heading Up (HDG UP).

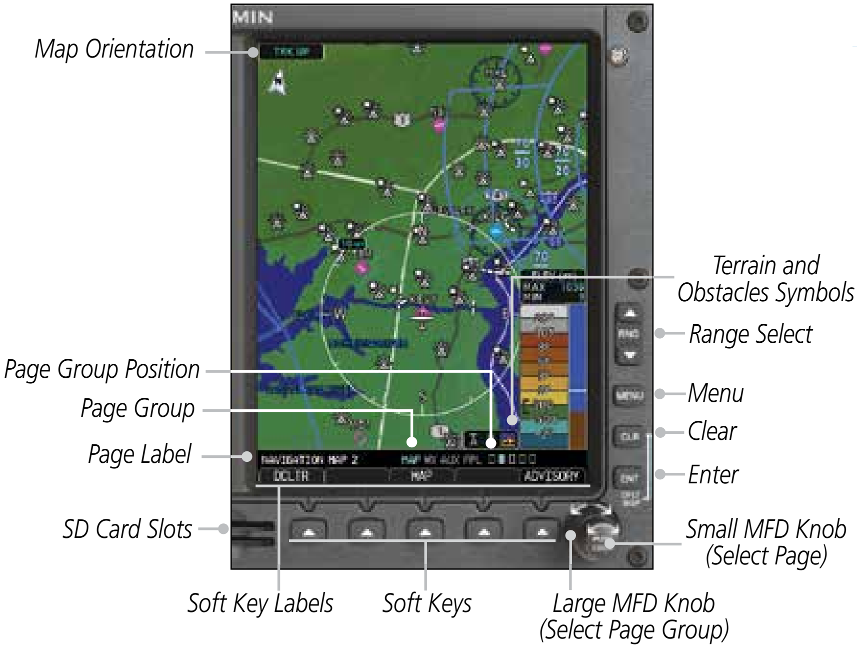

Map Orientation
Terrain and Obstacles Symbols
Range Select
Page Group Position
Page Group
Menu
Clear
Page Label
Enter
SD Card Slots
Small MFD Knob (Select Page)
Soft Key Labels
Soft Keys
Large MFD Knob (Select Page Group)
NAVIGATION MAP 2
MAP WX AUX FPL
DCLTR
MAP
ADVISORY

Figure 3-1 MFD Description

The nose of the aircraft icon is placed on the Navigation Map at the location corresponding to the calculated present position. The aircraft position and the flight plan legs are based on information received from the currently selected GPS navigator. The leg of the active flight plan currently being flown is shown as a magenta line on the navigation map. The other legs are shown in white.

There are map ranges available, from 500 feet to 500 NM. The range is now indicated in the box on the range ring at the 11 o-clock position relative to the ownship. To change the map range on any map, press the **RNG** keys on the right side of the bezel.

3.1 Navigation Map Pages

Map displays are used extensively in the GDU 620 to provide situational awareness in flight. The following information can be displayed on the Navigation Map Pages:

- Airports, NAVAIDs, airspace, airways, land data (highways, cities, lakes, rivers, borders, etc.) with names
- Map Pointer information (distance and bearing to pointer, location of pointer, name, and other pertinent information)
- Map range
- Wind direction and speed
- Map orientation
- Icons for enabled map features
- Aircraft icon (representing present position)
- Nav range ring
- Flight plan legs
- Track vector
- Topography scale
- Topography data
- XM NEXRAD Weather
- XM Lightning
- XM Storm Cells
- Traffic
- Stormscope
- Top of Climb
- Terrain data (includes terrain, obstacles, and power lines)

Symbols used on the MFD are detailed in Section 7 - Symbols.

***NOTE:** Page Group and Page are shown at the bottom of the MFD.*

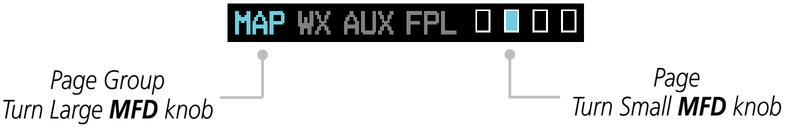


Figure 3-2 Page Group and Page Locator

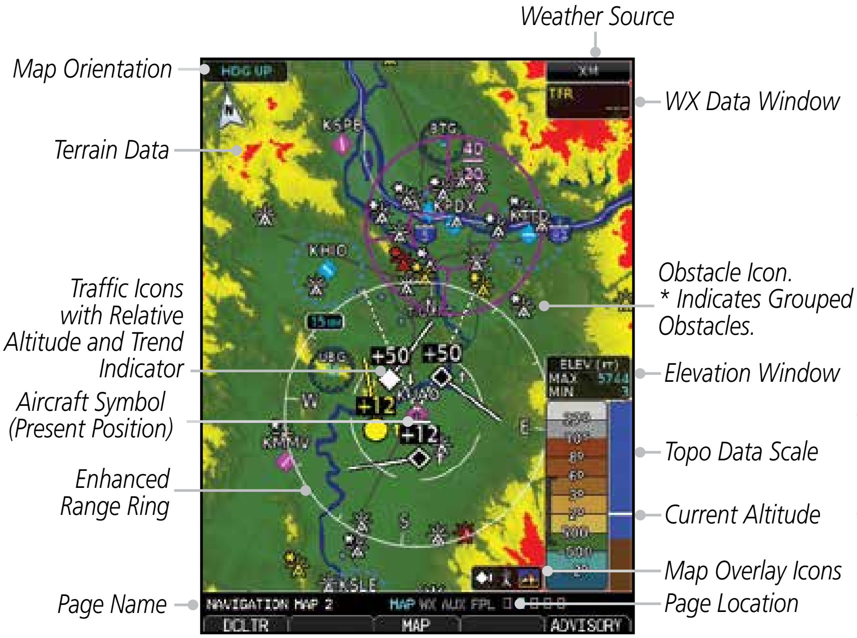

Weather Source
Map Orientation
WX Data Window
Terrain Data
Traffic Icons with Relative Altitude and Trend Indicator
Obstacle Icon. * Indicates Grouped Obstacles.
Elevation Window
Aircraft Symbol (Present Position)
Topo Data Scale
Enhanced Range Ring
Current Altitude
Map Overlay Icons
Page Name
Page Location
HDG UP
XM
TFR
KSPB
KPDX
KTTD
KHIO
+50
+50
+12
+12
KMMV
KSLE
ELEV (FT)
MAX 5744
MIN 3
NAVIGATION MAP 2
MAP WX AUX FPL
DCLTR
MAP
ADVISORY

Figure 3-3 MFD Map Description

3.1.1 Default Navigation Map Page

While on any page of the MFD, you may easily return to the first Navigation Map page of the Map group by pressing and holding the **CLR** key to return to the first page (Home Page) of the Map group.

3.1.2 Map Overlay Icons

Overlay icons are displayed to indicate data that will be depicted on the map pages. The icons are shown onIf the icon is not displayed, either the menu selection is not ON to display the data or the display range makes the data ineligible for display. If the icon has a white X over it then the data is selected ON and the zoom scale is correct, but the underlying data is not available for some reason. All of the icons may not be displayed at the same time. In some cases if one feature is selected, another icon and featuare may be disabled. The pilot should check the dedicated page for the feature that the icon represents to determine why the data is not available for display (fail, standby, etc).

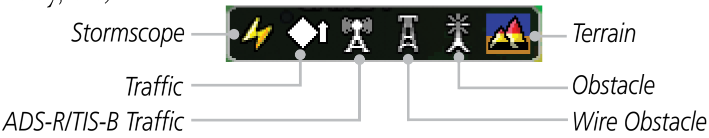


Figure 3-4 Map Overlay Icon Samples

3.1.3 Selecting Page Options

1) Change the fields or the setup of a page by pressing the **MENU** key and make the necessary adjustments with the **MFD** knobs.

2) Turn the large **MFD** knob to select desired item.

3) Turn the small **MFD** knob to change the highlighted value.

4) Press **ENT** to accept the displayed value.

5) Press the small **MFD** knob to cancel selection or to end editing.

3.1.4 Changing the Navigation Map Range

The Range (RNG) keys on the right side of the bezel are used to change the map display range. Pressing the ▲ **RNG** key will zoom out (increasing the displayed map range) and pressing the ▼ **RNG** key will zoom in (decreasing the displayed map range). The Map Range is shown on the outer range ring. The map ranges available are from 250 feet to 500 NM.

3.1.5 Decluttering Map Pages

The Map Declutter feature allows the pilot to progressively step through four levels of decluttering to remove map information. The declutter level is displayed in the **DCLTR** soft key.

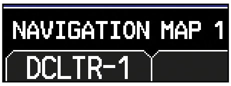


Figure 3-5 Map Declutter Soft Key

1) There are four levels of decluttering. DCLTR (0) shows the most detail. DCLTR-3 removes the most detail.

2) While viewing one of the Navigation Map pages, press the **DCLTR** soft key. Each successive press of the **DCLTR** soft key will toggle through the declutter levels. In the following table, features marked with a "•" are shown at the indicated Declutter Level. Features shown at level 0 will be displayed at all Declutter levels.

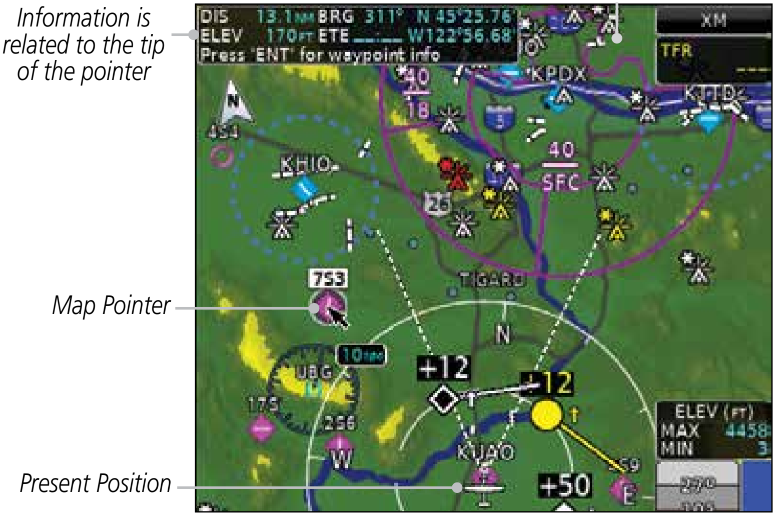
***NOTE:** Traffic is automatically decluttered from Nav Map pages when the map scale is above 40 NM.*

Feature	0	1	2	3	Feature	0	1	2	3
Airways	•				Tower	•	•		
Land/Country Text	•				TRSA	•	•		
Large City	•				ADIZ	•	•		
Medium City	•				Alert Areas	•	•		
Small City	•				Caution Areas	•	•		
Small Town	•				Danger Areas	•	•		
Freeways	•				Warning Areas	•	•		
Highways	•				Large Airports	•	•	•	
Roads	•				Medium Airports	•	•	•	
Railroads	•				Prohibited Areas	•	•	•	
Political Boundaries	•				MOAs	•	•	•	
Traffic Symbols	•				Runway Labels	•	•	•	
Lat/Lon Grids	•	•			Lightning Strike Data	•	•	•	
VORs	•	•			NEXRAD Data	•	•	•	
NDBs	•	•			River/Lake Names	•	•	•	•
Intersections	•	•			Traffic Labels	•	•	•	•
Class B Airspace	•	•			Water Detail	•	•	•	•
Class C Airspace	•	•			Active FPL Legs	•	•	•	•
Class D Airspace	•	•							

Table 3-1 Features Shown at Each Decluttering Level

3.1.6 Panning

The Panning Map Page function allows you to move the map beyond its current limits without adjusting the map scale and to examine information at the pointer location. When you select the panning function — by pressing the small **MFD** knob — a target pointer flashes on the map display. A window also appears at the top of the map display showing the latitude/longitude position of the pointer, the ETE from your present position to the pointer, elevation at the pointer, and bearing and distance to the pointer from your present position.


DIS 13.1NM BRG 311° N 45°25.76'
ELEV 170FT ETE __.__ W122°56.68'
Press 'ENT' for waypoint info

Information is related to the tip of the pointer
Map Pointer
Present Position
XM
TFR
KPDX
KTTD
KHIO
TIGARD
753
10nm
UBG
175
256
W
N
+12
+12
KUAO
+50
E
ELEV (FT)
MAX 4458
MIN 3
40
18
40
SFC

Figure 3-6 Navigation Map Pointer Location Information

1) While viewing a Map, press the small **MFD** knob. A flashing pointer will appear in the tip of the ownship symbol. The measured information is referenced to the tip of the arrow.

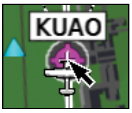


Figure 3-7 Navigation Map Initial Pointer Location

2) Turn the large **MFD** knob to move the cursor horizontally. Turn the small **MFD** knob to move the cursor vertically.

3) Press the small **MFD** knob again to cancel panning. The display will return to the previous map view.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

3.1.7 Selecting Items on the Map

When the target pointer is placed on an object, the name of that object is highlighted (even if the name wasn't originally displayed on the map). This feature applies to airports, NAVAIDs, user-created waypoints, roads, lakes, rivers — just about everything displayed on the map except route lines. When an airport, NAVAID, or user waypoint is selected on the map display, you can review information about the item.

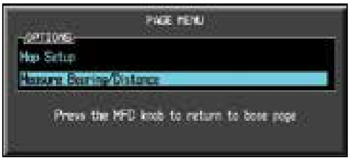
1) While viewing the Navigation Map pages of the Map page group, press the small **MFD** knob to activate panning.
2) Move the cursor with the small and large **MFD** knobs to highlight a feature.
3) Press **ENT** to display information about the highlighted feature.
4) Press one of the soft keys for details of the selected topic.
5) Press the small **MFD** knob again to return to panning.

3.1.8 Measuring Distances

The “Measure Bearing/Distance” function provides a quick and easy method to determine the bearing and distance between any two points on the Navigation Map.

1) While viewing one of the Navigation Map pages of the Map page group, press **MENU.**

2) Turn the large or small **MFD** knobs to highlight “Measure Bearing/ Distance“ and then press **ENT**.


PAGE MENU
OPTIONS
Map Setup
Measure Bearing/Distance

Press the MFD knob to return to base page

Figure 3-8 Navigation Map Measure Distance Function

3) Your present position will be marked as the starting reference point. To choose a different starting reference point, turn the large or small **MFD** knobs to desired point and press **ENT**.

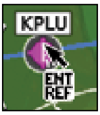
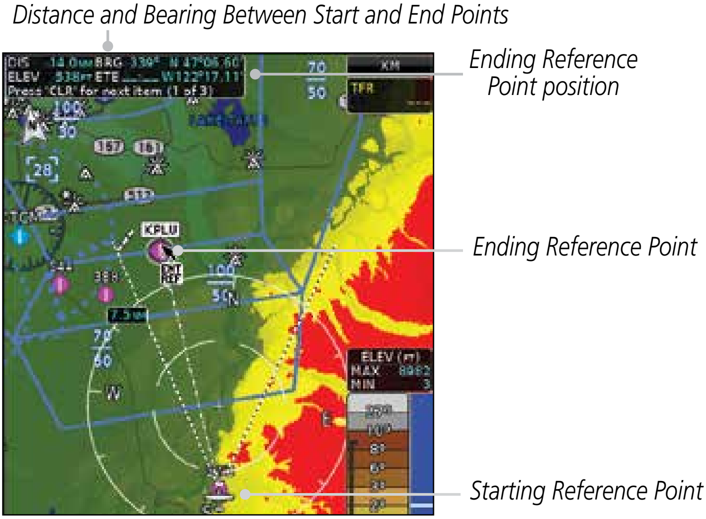

KPLU
ENT
REF

Figure 3-9 Measure Distance Starting Reference Point

4) Turn the large or small **MFD** knobs to move the cursor to a reference point. The distance and bearing is displayed at the top of the display.



DIS 14.0NM BRG 339° N 47°06.60'
ELEV 538FT ETE ___ W122°17.11'
Press 'CLR' for next item (1 of 3)

Distance and Bearing Between Start and End Points
Ending Reference Point position
Ending Reference Point
Starting Reference Point
70
50
KM
TFR
100
30
157
161
28
KPLU
ENT
REF
100
50
7.5NM
70
60
W
E
ELEV (FT)
MAX 8892
MIN 3

Figure 3-10 Bearing/Distance Measurement

5) Press the small **MFD** knob to stop measuring.

3.1.9 Customizing Navigation Map Pages

The Navigation Map pages are customized by selecting options from the Page Menu. The Page Menu options include choices for Map Setup and Measure Bearing/Distance. The Map Setup choice covers selections for Map, Weather, Traffic, and Aviation depending on the installed equipment of a given aircraft.

3.1.10 Map Setup

The Map Setup selection from the Page Menu allows you to select which data will be displayed on the map.

1) While viewing one of the Navigation Map pages of the Map page group, press the **MENU** key to display the Navigation Map Page Menu.

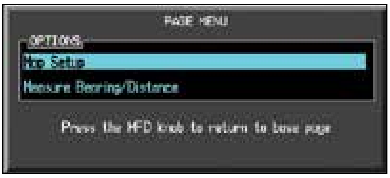


Figure 3-11 Navigation Map Page Menu

2) With the cursor flashing on the "Map Setup" option. Press the **ENT** key to display the Map Setup Menu.

3) Use the large and small **MFD** knobs to select the Group and press **ENT** to allow editing of the selected group. The groups shown depend on the features available for equipment installed in your aircraft.

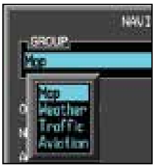


Figure 3-12 Navigation Map Page Menu Map Group Selection

4) Press the small **MFD** knob to return to the Navigation Map Page.

Map Group		Weather Group (optional)		Traffic Group (optional)		Aviation Group	
Menu Item	**Adjustment**	**Menu Item**	**Adjustment**	**Menu Item**	**Adjustment**	**Menu Item**	**Adjustment**
Orientation	North Up Track Up DTK Up HDG Up	NEXRAD Viewing Range	Off/Range	Traffic	Off All Traffic TA/PA TA Only	Safe Taxi Viewing Range	Off/Range
North Up At	Off/Range	NEXRAD Cell Mov	Off/Range			Rwy Extension Range	Off/Range
Auto Zoom	On/Off	NEXRAD Legend	On/Off			INT/NDB Viewing Range *	Off/Range
Land Data	On/Off	NEXRAD Source	US/Canada			VOR Viewing Range*	Off/Range
Track Vector Length	Off/Time	XM Ltng	Off/Range			Class B/ TMA *	Off/Range
Wind Vector	On/Off	Stormscope Viewing Range	Off/Range			Class C/ TCA *	Off/Range
Enhanced Nav Range Ring	On/Off	Stormscope Strike/Cell Mode	Strike/Cell			Class D *	Off/Range
Topo Data	On/Off					Restricted*	Off/Range
Topo Scale	On/Off					MOA (Military)*	Off/Range
Terrain Data	On/Off					Other/ ADIZ *	Off/Range
Obstacle Viewing Range	Off/Range					TFR *	Off/Range
Power Line Viewing Range	Off/Range					Airways	Off/Modes
Lat/Lon Viewing Range	Off/Range					Smart Airspace	On/Off
Field of View**	On/Off					Show Airspaces	All/Altitude
Selected Alt Range Arc	On/Off					Airspace Labels	On/Off

* - shown if the Aviation database is current. ** - shown if Synthetic Vision is available.

Table 3-2 Navigation Map Page Menu Selections

3.1.10.1 Map Feature Options

Choose the options to determine the values for display on each Navigation Map. The options you save will be retained until changed. The options may be selecting by using the following procedure:

1) While viewing the Navigation Map 1 or 2 of the Map page group, press the **MENU** key. With "Map Setup" highlighted, press **ENT**. With the Map Group active, turn the large **MFD** knob to highlight the desired option.

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Map Orientation

The Orientation option sets the orientation of the Navigation Map.

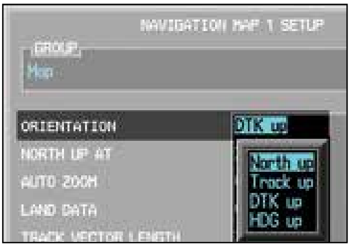


Figure 3-13 Navigation Map Orientation

North Up At

The North Up At option allows you to select the map range where at and above the selected value the Map Orientation will automatically change to North Up. For example, with the 500 NM value selected and the map range of the MFD is 500 NM or more, the map orientation will automatically become North Up.

Auto Zoom

With a valid flight plan, the Auto Zoom feature will automatically change the Navigation Map range depending on the distance to the next waypoint in the flight plan. If enabled, it will also automatically zoom to the SafeTaxi zoom range when the aircraft is on the ground. Auto Zoom can be overridden at any time by manually zooming with the **RNG** keys or enabling OBS mode. Auto Zoom is re-enabled once one of the following conditions is met:

Land Data

The Land Data option selects whether detailed land features, such as rivers, roads, cities, are displayed. Topo features, traffic, terrain, and obstacles will still be displayed, even with Land Data turned off.

Track Vector Length

When turned on, the Track Vector Length option will show a dashed line and arrow extending from the aircraft icon illustrating the current Track and the distance the aircraft will travel in the selected time.

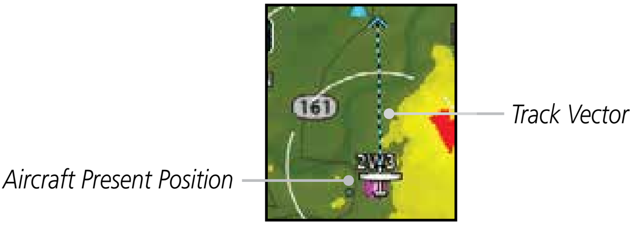


Figure 3-14 Navigation Map Track Vector

Wind Vector

The Wind Vector option when turned on will show a box in the top right corner of the MFD indicating the wind direction and speed.

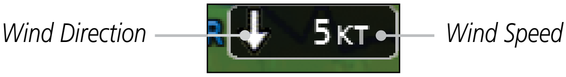


Figure 3-15 Navigation Map Wind Vector Display

Nav Range Ring

When turned on, the Nav Range Ring option will show a ring with a compass rose oriented to magnetic north around your present position on the Map page. When selected ON, the Enhanced Range Ring function provides a second ring at 1/2 the distance of the primary ring to allow the pilot to acccurately judge distance to objects depicted on the map.

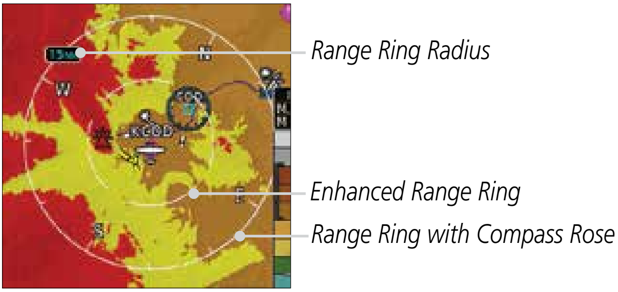
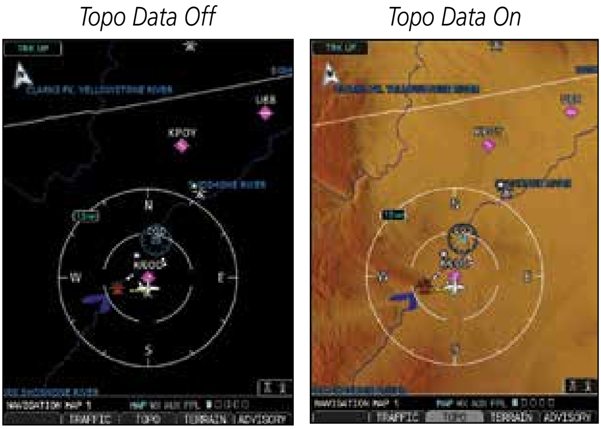

Range Ring Radius
Enhanced Range Ring
Range Ring with Compass Rose
15NM
N
W
E
S
KCDD

Figure 3-16 Navigation Map Range Ring

Topo Data

The Topo Data option selects whether the colored topographical features are displayed. Traffic, Land Data, Terrain, and Obstacles will still be displayed even with Topo Data turned off.



Topo Data Off *Topo Data On*

Figure 3-17 Navigation Map Topo Data

Topo Scale

The Topo Scale option selects whether the elevation scale for topographical features on the Navigation Map is displayed. The scale will be located on the right side of the display.

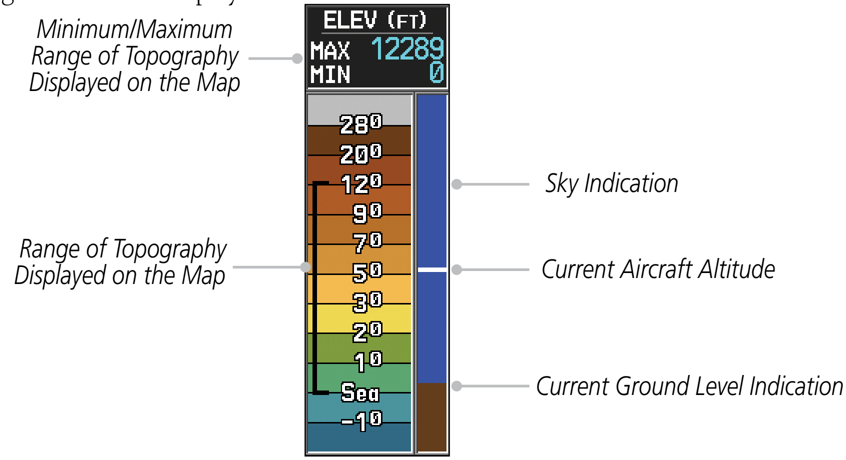

Minimum/Maximum Range of Topography Displayed on the Map
ELEV (FT)
MAX 12289
MIN 0
280
200
120
90
70
50
30
20
10
Sea
-10
Range of Topography Displayed on the Map
Sky Indication
Current Aircraft Altitude
Current Ground Level Indication

Figure 3-18 Navigation Map Topo Scale

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

Terrain Data

The Terrain Data option selects whether Terrain Data is shown on the Navigation Map. The Terrain Data Icon will be shown when Terrain has been selected.

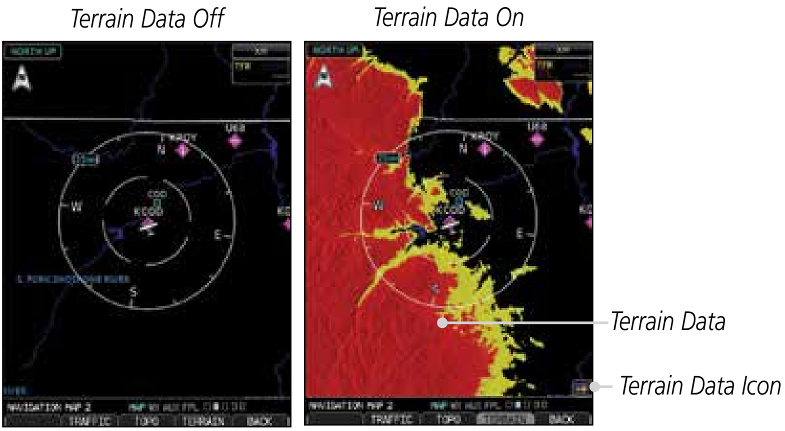

Terrain Data Off
Terrain Data On
Terrain Data
Terrain Data Icon
NAVIGATION MAP 2
TRAFFIC
TOPO
TERRAIN
BACK

Figure 3-19 Navigation Map Terrain Data

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

Obstacle Data Viewing Range

The Obstacle Data Viewing Range option selects whether the Obstacle Data is shown on the Navigation Map. Obstacles will be shown at and below the selected map range. Map ranges above this value will not show the Obstacle Data. In the range selection example below where 30 NM is selected, obstacles will be shown at map ranges of 30 NM and lower.

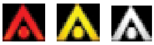
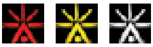
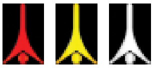
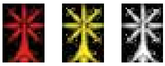
Unlighted Obstacle (Height is less than 1000 ft AGL)	Lighted Obstacle (Height is less than 1000 ft AGL)	Unlighted Obstacle (Height is greater than 1000 ft AGL)	Lighted Obstacle (Height is greater than 1000 ft AGL)
			

Table 3-3 Navigation Map Obstacle Icons

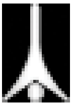
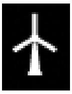
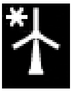
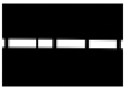
Tower	Windmill	Windmill in Group	Power Line
			

Table 3-4 Obstacle Icon Types

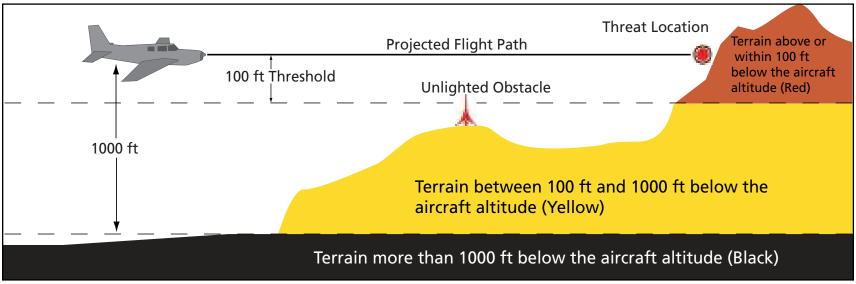

Threat Location
Projected Flight Path
Terrain above or within 100 ft below the aircraft altitude (Red)
100 ft Threshold
Unlighted Obstacle
1000 ft
Terrain between 100 ft and 1000 ft below the aircraft altitude (Yellow)
Terrain more than 1000 ft below the aircraft altitude (Black)

Figure 3-20 TERRAIN Altitude/Color Correlation

Grouped obstacles are shown with an asterisk (as shown in the Windmill in Group example above). The color of the asterisks is tied to the relative altitude of the highest obstacle in the group, not other obstacles within that group. Obstacles are grouped when they would otherwise overlap. If map zoom scale is change sufficiently that obstacles can be drawn without overlapping they will be depicted individually.

Obstacle databases created for software version 7.00 or later may include HOT lines depending on the type of obstacle database installed. Hazardous Obstacle Transmission (HOT) Lines are those power lines that that have been identified as a potential hazard to aircraft. The installed obstacle database type can be verified on the System Status page. Power line data is available for the contiguous United States as well as small parts of Canada and Mexico.

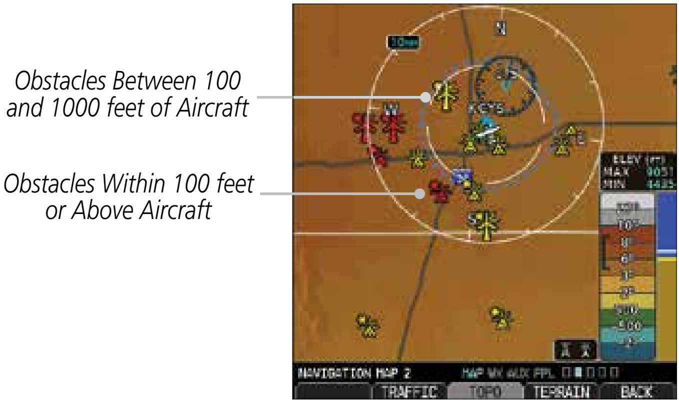

Obstacles Between 100 and 1000 feet of Aircraft
Obstacles Within 100 feet or Above Aircraft
10nm
N
KCOS
ELEV (FT)
MAX 9051
MIN 4435
NAVIGATION MAP 2
MAP WX AUX FPL
TRAFFIC
TOPO
TERRAIN
BACK

Figure 3-21 Navigation Map Obstacle Data

Lat/Lon Viewing Range

The Lat/Lon Viewing Range option selects whether Lat/Lon line is shown on the MFD.

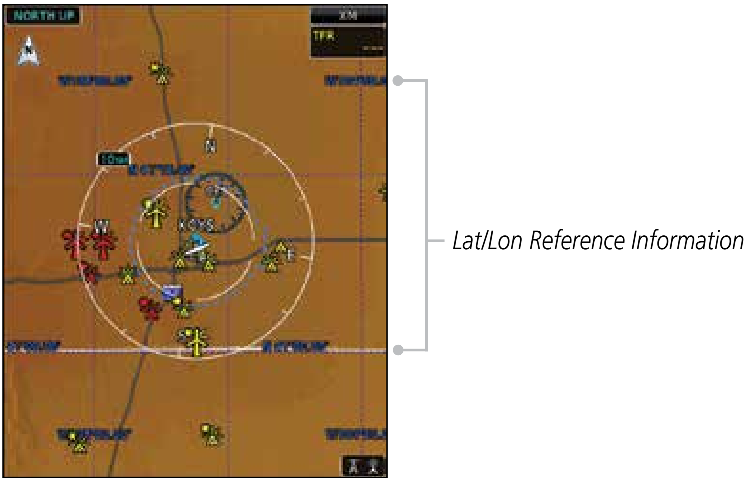
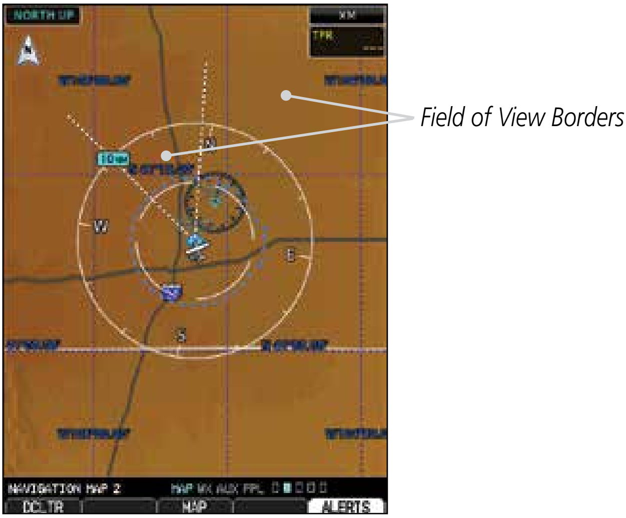

NORTH UP
XM
TFR
10nm
N
KCOS
Lat/Lon Reference Information

Figure 3-22 Navigation Map Lat/Lon Information

Field of View

The Field of View represented by the synthetic terrain data used for the Synthetic Vision Technology (SVT™) option (when enabled) can be represented on the MFD Navigation Map Page lateral image. Two dashed lines forming a V-shape in front of the aircraft symbol on the MFD, represent the forward viewing area shown on the PFD.

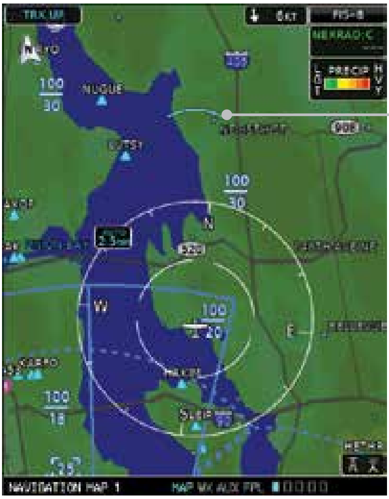


Field of View Borders

Figure 3-23 Navigation Map Field of View on the MFD

Selected Altitude Range Arc

The range to altitude arc may be selected for display on the MFD navigation map to predict where the ownship will be when it reaches the altitude selected on the altitude alerter on the PFD. The distance from the ownship to the arc is based on ground speed, baro altitude, selected altitude, and vertical speed. The arc is shown when the aircraft is moving toward the selected altitude at a vertical speed of at least 150 feet per minute.


TRK UP
FIS-B
NEXRAD-C
PRECIP
NUGUE
100
30
N
W
E
100
20
100
18
METAR
NAVIGATION MAP 1
MAP WX AUX FPL

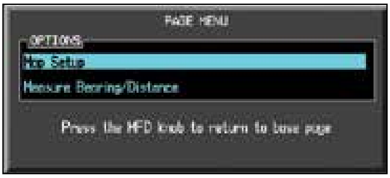
Selected Altitude Range Arc

Figure 3-24 Selected Altitude Range Arc

3.1.10.2 Weather Feature Options (Optional)

The Weather group selection from the Map Setup Page Menu allows you to customize the NEXRAD Viewing Range, NEXRAD Cell Movement, and Lightning Viewing range. Weather is an optional feature that requires a GDL 69/69A and an XM WX Satellite Weather subscription, or other weather product (such as GFDS).

1) While viewing the Navigation Map 1 or 2 page of the Map page group, press the **MENU** key to display the Navigation Map Page Menu.



Press the MFD knob to return to base page

Figure 3-25 Navigation Map Page Menu

2) With the cursor flashing on the "Map Setup" option, press the **ENT** key to display the Map Setup Menu.

3) Use the large and small **MFD** knobs to select the Weather Group and press **ENT** to allow editing of the selected group. The groups shown depend on the features available for equipment installed in your aircraft.

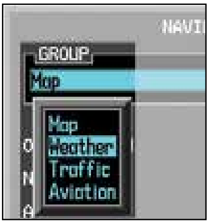


Figure 3-26 Navigation Map Page Menu Weather Group Selection

4) Press the small **MFD** knob to return to the Navigation Map Page.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

NEXRAD Data Viewing Range

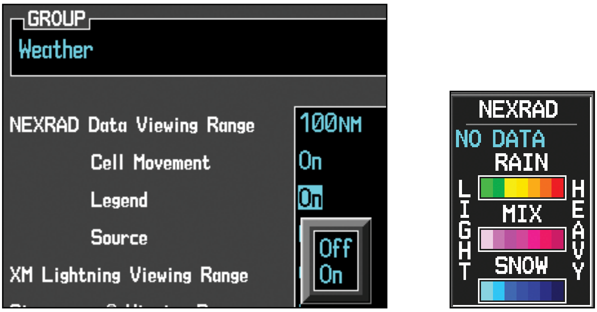
The NEXRAD Viewing Range option selects whether the NEXRAD weather products is shown on the MFD. NEXRAD weather products will be shown at and below the selected map range. When Off is selected, NEXRAD weather will not be shown. Map ranges above the selected value will not show the NEXRAD weather products. Where 100 NM is selected, the NEXRAD weather products will be shown at map ranges of 100 NM and lower.

NEXRAD Cell Movement

The NEXRAD Cell Movement option selects whether NEXRAD Cell Movement is shown on the Navigation Map.

NEXRAD Legend

The NEXRAD Legend selection provides the option of displaying an abbreviated version of the NEXRAD legend in the top right region of the MFD.



GROUP
Weather

NEXRAD Data Viewing Range 100NM
Cell Movement On
Legend On
Source
XM Lightning Viewing Range

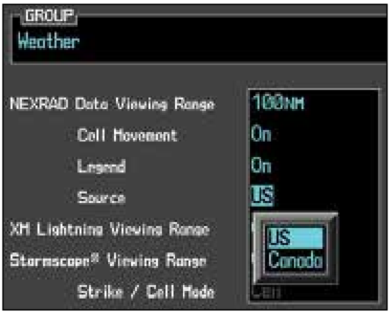
Figure 3-27 NEXRAD Legend Selection

Datalink Lightning Viewing Range

The Lightning Viewing Range option selects whether the datalink provided Lightning weather products is shown on the Navigation Map. Lightning weather products will be shown at and below the selected map range. When Off is selected, Lightning weather will not be shown. Where 100 NM is selected, Lightning symbols will be shown at map ranges of 100 NM and lower.

XM/FIS-B NEXRAD Source

The XM or FIS-B NEXRAD Source selection allows the choice of the available sources for NEXRAD weather products.



GROUP
Weather

NEXRAD Data Viewing Range 100NM
Cell Movement On
Legend On
Source US
XM Lightning Viewing Range
Stormscope® Viewing Range
Strike / Cell Mode Cell

Figure 3-28 NEXRAD Weather Source Selection

Stormscope® Viewing Range

The Stormscope Viewing Range option selects Stormscope cells or strikes are shown on the Navigation Map. Products will be shown at and below the selected map range. When Off is selected, cells or strikes will not be shown. Where 100 NM is selected, symbols will be shown at map ranges of 100 NM and lower.

***NOTE:** The selected lightning display type, cell or strike, will be shown the same on both the StormScope and the Map pages.*

***NOTE:** StormScope data is displayed on the Map Page only if aircraft heading is available.*

***NOTE:** The G500/600 will display StormScope data with or without a heading source. If no heading source is available, the display will indicate this by placing "HDG N/A" in the upper right portion of the display. If no heading is available, the pilot must clear the strikes after each heading change.*

Strike/Cell Mode

When the Stormscope Viewing Range option has a range greater than zero, the Stormscope cells or strikes option is made available and can determine which type are shown on the Navigation Map.

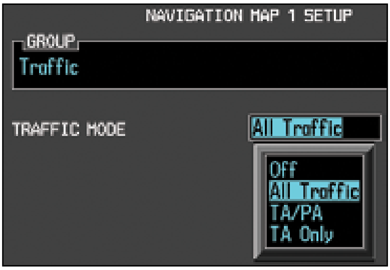
3.1.10.3 Traffic Feature Options (Optional)

The Traffic group selection from the Map Setup Page Menu allows you to customize the display of traffic on the Navigation Map. The Traffic function requires the installation of a compatible traffic device.

***NOTE:** As a decluttering function, traffic labels will not be drawn when the map scale is above 15 NM and traffic symbols will not be drawn when the map scale is above 40 NM.*

Traffic Selection	Display Result
Off	No traffic displayed
All Traffic	All types of traffic displayed
TA/PA	Traffic Alerts and Proximity Alerts displayed
TA Only	Traffic Alerts Only displayed

Table 3-5 Navigation Map Traffic Display Options



NAVIGATION MAP 1 SETUP

GROUP Traffic

TRAFFIC MODE All Traffic

Figure 3-29 Navigation Map Page Menu Traffic Group Selection

1) While viewing the Navigation Map Setup page and the Traffic Group active, turn the large **MFD** knob to highlight the “Traffic” options.

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

When the Traffic overlay is active on a Map page, a Traffic icon will be displayed on the Map page where it is selected.

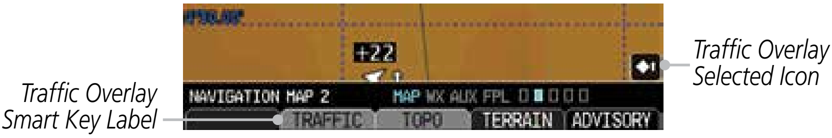

+22
NAVIGATION MAP 2
MAP WX AUX FPL
TRAFFIC
TOPO
TERRAIN
ADVISORY
Traffic Overlay Smart Key Label
Traffic Overlay Selected Icon

Figure 3-30 Navigation Map Traffic Overlay

3.1.10.4 Aviation Feature Options

The Aviation group selection from the Map Setup Page Menu allows you to customize the display of SafeTaxi information, Runway Extensions, Intersection/NDB locations, VOR locations, and TFR icons on the Navigation Map.

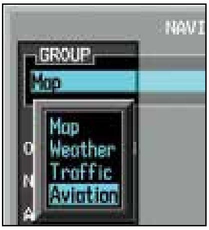

NAVI
GROUP
Map
Map
Weather
Traffic
Aviation

Figure 3-31 Navigation Map Page Menu Aviation Group Selection

SafeTaxi™ Viewing Range

The SafeTaxi™ viewing range option selects the range at which SafeTaxi information is shown on the Navigation Map. SafeTaxi will be shown at and below the selected map range. When Off is selected, SafeTaxi information will not be shown. Where 1 NM is selected, the SafeTaxi information will be shown at map ranges of 1 NM and lower.

Runway Extension Range

The Runway Extension Range option selects the whether Runway Extensions is shown for the flight plan destination airport runway and will extend 10 NM. Runway Extensions will be shown at and below the selected map range. When Off is selected, Runway Extensions will not be shown.

INT/NDB Viewing Range

The INT/NDB viewing range option selects whether Intersection and NDB information is shown on the Navigation Map. Intersection and NDB information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 15 NM is selected, INT/NDBs will be shown at map ranges of 15 NM and lower.

VOR Viewing Range

The VOR viewing range option selects whether VOR information is shown on the Navigation Map. VOR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 150 NM is selected, VOR information will be shown at map ranges of 150 NM and lower.

Class B/TMA Airspace Viewing Range

The Class B/TMA airspace viewing range option selects whether Class B/TMA airspace information is shown on the Navigation Map. Class B/TMA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, Class B/TMA airspace information will be shown at map ranges of 100 NM and lower.

Class C/TCA Airspace Viewing Range

The Class C/TCA airspace viewing range option selects whether Class C/TCA airspace information is shown on the Navigation Map. Class C/TCA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, Class C/TCA airspace information will be shown at map ranges of 100 NM and lower.

Class D Airspace Viewing Range

The Class D airspace viewing range option selects whether Class D airspace information is shown on the Navigation Map. Class D airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, Class D airspace information will be shown at map ranges of 100 NM and lower.

Restricted Airspace Viewing Range

The Restricted airspace viewing range option selects whether the map range is shown on the Navigation Map. Restricted airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, Restricted airspace information will be shown at map ranges of 100 NM and lower.

MOA (Military) Viewing Range

The MOA (Military) viewing range option selects whether MOA (Military) information is shown on the Navigation Map. MOA airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, MOA airspace information will be shown at map ranges of 100 NM and lower.

Other/ADIZ Airspace Viewing Range

The Other/ADIZ airspace viewing range option selects whether Other/ADIZ airspace information is shown on the Navigation Map. Other/ADIZ airspace information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, Other/ADIZ airspace information will be shown at map ranges of 100 NM and lower.

TFR Viewing Range (optional)

The Temporary Flight Restriction (TFR) viewing range option selects whether TFR information is shown on the Navigation Map. TFR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. Where 100 NM is selected, TFR information will be shown at map ranges of 100 NM and lower. This optional feature requires an active data link receiver. TFRs are provided through the datalink. Some TFRs may exist that are not available to the datalink provider and as such will not be displayed.

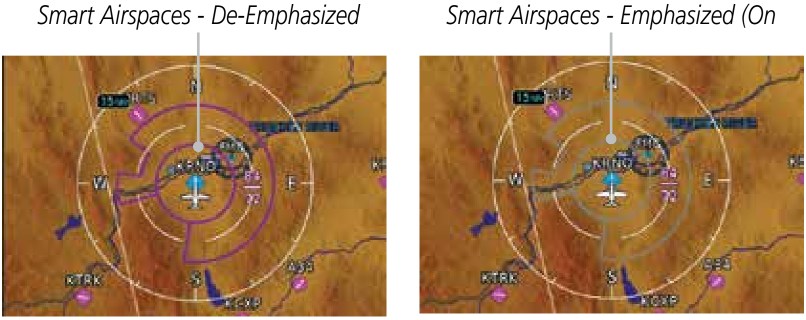
Airways

The Airways option allows you to select the airways that are shown on the Navigation Map. All, Low only, and Hi only Airways may be selected. When Off is selected, airways will not be shown.

Smart Airspace

The Smart Airspaces selection filters airspaces to show the ones appropriate for your altitude. Garmin's Smart Airspace™ feature aids visual clarity on-screen by de-emphasizing airspace that's well above or below the aircraft's current altitude. The vertical separation is 1,000 feet at sea level and the vertical separation will gradually increase to 2,000 feet until the aircraft reaches 10,000 feet. Anything above 10,000 feet keeps the 2,000 feet vertical separation.

***NOTE:** Smart Airspace only changes the depiction of the airspace on the moving map display. It does not alter the Airspace Alerts that can be set on the System-Alerts portion of the system.*



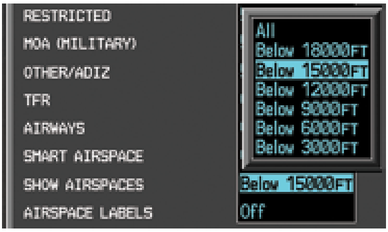
Smart Airspaces - De-Emphasized

Smart Airspaces - Emphasized (On

Figure 3-32 Display of Smart Airspaces (Airspace Borders Grayed When Emphasized)

Show Airspace

The Airspace viewing range options select whether the Airspaces are shown on the Map and at and below the selected map ranges.



RESTRICTED
MOA (MILITARY)
OTHER/ADIZ
TFR
AIRWAYS
SMART AIRSPACE
SHOW AIRSPACES: Below 15000FT
AIRSPACE LABELS: Off

Figure 3-33 Display of Smart Airspaces

Airspace Labels

The Airspace Label feature shows the airspace altitude limits within the selected range.

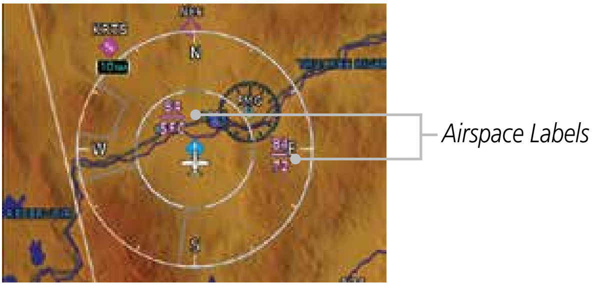


Figure 3-34 Airspace Labels

3.1.11 Split Screen (Optional)

External Video is an optional function that displays video provided by an externally mounted video source on the aircraft.

1) While viewing the Map function, turn the small **MFD** knob to the third Navigation Map page.

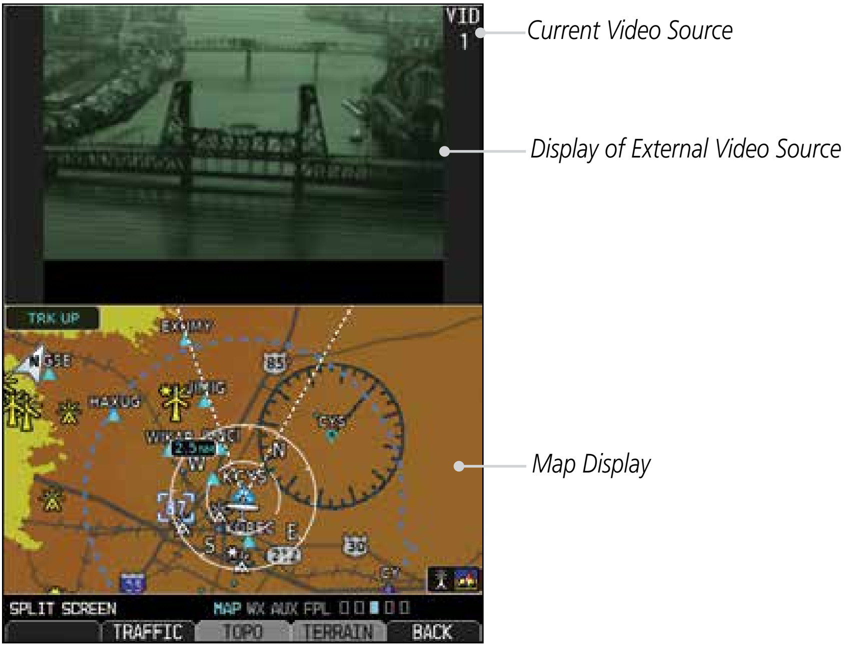
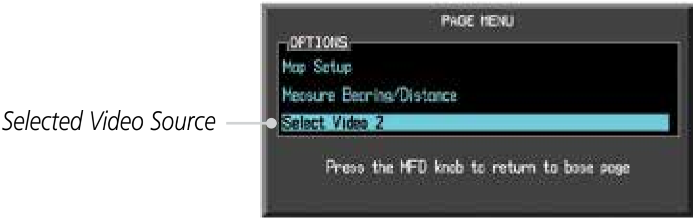

VID 1
Current Video Source
Display of External Video Source
TRK UP
Map Display
SPLIT SCREEN
MAP WX AUX FPL
TRAFFIC
TOPO
TERRAIN
BACK

Figure 3-35 External Video

2) The External Video page will show the external video on the top half of the MFD and a Navigation Map will be shown on the lower half.

3) To select the other external video source, press the **MENU** key.


Selected Video Source
PAGE MENU
OPTIONS
Map Setup
Measure Bearing/Distance
Select Video 2

Press the MFD knob to return to base page

Figure 3-36 Aux Mode System Setup Page Menu

4) Turn the large or small **MFD** knobs to highlight the Video selection and then press **ENT**.

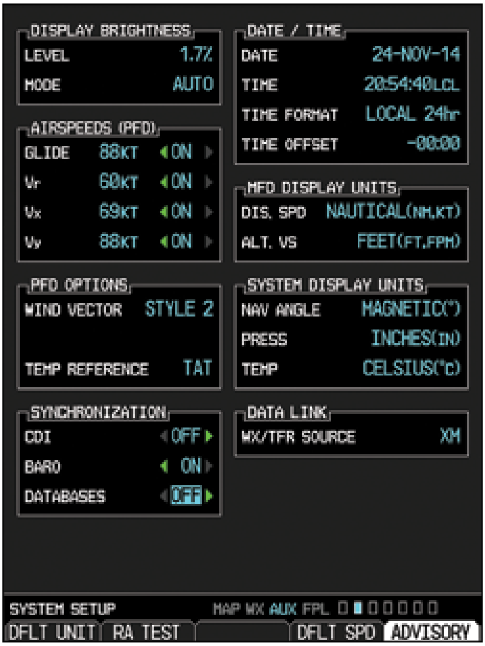
3.2 Aux Mode Pages

The Aux mode provides pages for System Setup, XM Information (if installed), and system Status.

3.2.1 System Settings

G500/600 system settings are managed from the Aux Mode System Setup Page. The following settings can be changed:

- Display Brightness (Mode and Level)
- Airspeeds (Glide-REF, V_R, V_X - V1, and V_Y - V2)
- PFD Options (Wind Vector, Nav Status Styles, and Temp Reference)
- Dual Unit Synchronization (CDI, Baro, and some Databases)
- Date/Time (Date, Time, Time Format, and Time Offset)
- MFD Display Units (Distance/Speed and Altitude/Vertical Speed)
- System Display Units (Navigation Angle Reference, Pressure Units, and Temperature Units)
- Data Link (FIS, XM, GFDS)



DISPLAY BRIGHTNESS
LEVEL 1.7%
MODE AUTO

AIRSPEEDS (PFD)
GLIDE 88KT ◀ON ▶
Vr 60KT ◀ON ▶
Vx 69KT ◀ON ▶
Vy 88KT ◀ON ▶

PFD OPTIONS
WIND VECTOR STYLE 2
TEMP REFERENCE TAT

SYNCHRONIZATION
CDI ◀OFF▶
BARO ◀ ON▶
DATABASES ◀OFF▶

DATE / TIME
DATE 24-NOV-14
TIME 20:54:40LCL
TIME FORMAT LOCAL 24hr
TIME OFFSET -00:00

MFD DISPLAY UNITS
DIS, SPD NAUTICAL(NM,KT)
ALT, VS FEET(FT,FPM)

SYSTEM DISPLAY UNITS
NAV ANGLE MAGNETIC(°)
PRESS INCHES(IN)
TEMP CELSIUS(°C)

DATA LINK
WX/TFR SOURCE XM

SYSTEM SETUP

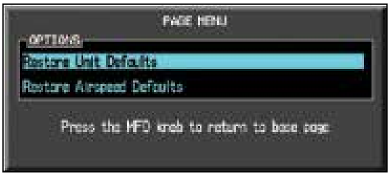
Figure 3-37 Aux Mode System Setup Page

The default values set by the installer during installation are restored by using the Page Menu options or soft keys. The "Restore Unit Defaults" menu selection and the **DFLT UNIT** soft key restores the default MFD Display and System Display Units settings. The "Restore Airspeed Defaults" menu selection or **DFLT SPD** soft key restores the default PFD Airspeeds settings.

The **RA TEST** soft key activates the Radar Altimeter test mode. See the Radio Altimeter section in Section 2 for details.

***NOTE:** Not all Radar Altimeters have the TEST function.*

1) While viewing the Aux mode System Setup page, press the **MENU** key.



Press the MFD knob to return to base page

Figure 3-38 Aux Mode System Setup Page Menu

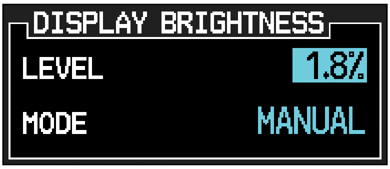
2) Turn the large or small **MFD** knobs to highlight the desired selection and then press **ENT**.

3.2.1.1 Display Brightness

Display brightness mode may be set to manual or automatic. The automatic mode will set the display brightness based on the ambient light. The manual mode allows the setting of display brightness between 0 and 100%.

1) Turn the large **MFD** knob to reach the AUX page group. Press the small **MFD** knob to activate the cursor.

2) The Level will be highlighted. Turn the small **MFD** knob to select the Display Brightness Level and then press **ENT.**

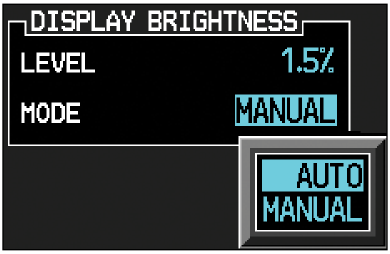


DISPLAY BRIGHTNESS
LEVEL 1.8%
MODE MANUAL

Figure 3-39 Aux Mode Display Brightness Level Selection

3) If the Level was changed, Manual will be selected. Press the cursor to save the settings. If you press **ENT** the Mode setting will be highlighted.

4) With the Mode value highlighted, turn the small **MFD** knob to select Auto or Manual and then press **ENT.**



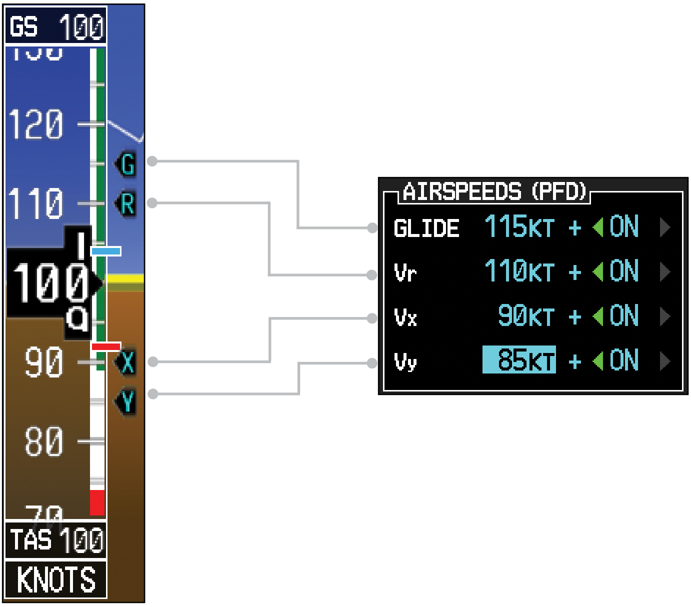
DISPLAY BRIGHTNESS
LEVEL 1.5%
MODE MANUAL

Figure 3-40 Aux Mode Display Brightness Mode Selection

3.2.1.2 Airspeed Reference Marks

The Best Glide (or REF), Vr, Vx (or V1), and Vy (or V2) airspeed reference marks for the PFD are adjusted with this function. A marker will appear on the PFD Airspeed tape at the selected speed when the value is set to "On." Default reference airspeeds are set during installation. When power is cycled, the values you set will be reset to the default values.

NOTE: When power is cycled, the Airspeed Reference values are reset. During preflight, the Airspeed Reference values should be checked and set appropriately for the current aircraft configuration and performance.



AIRSPEEDS (PFD)

GLIDE	115KT	ON
Vr	110KT	ON
Vx	90KT	ON
Vy	85KT	ON

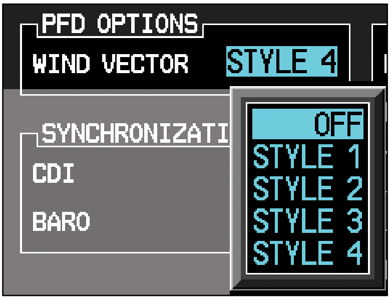
Figure 3-41 Airspeed References shown on PFD when activated

3.2.1.3 PFD Options - Wind Vector

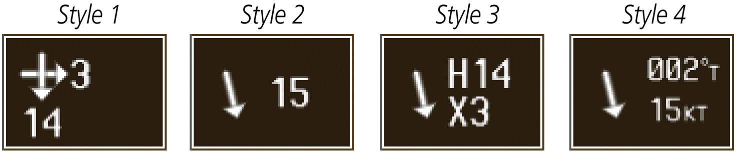
When selected, wind vector information is displayed on the PFD to the left of the HSI. Four styles are available.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the desired Wind Vector value.

2) Turn the small **MFD** knob to select the style and press **ENT**.



PFD OPTIONS
WIND VECTOR STYLE 4



Style 1
Style 2
Style 3
Style 4

Figure 3-42 Wind Vector Style

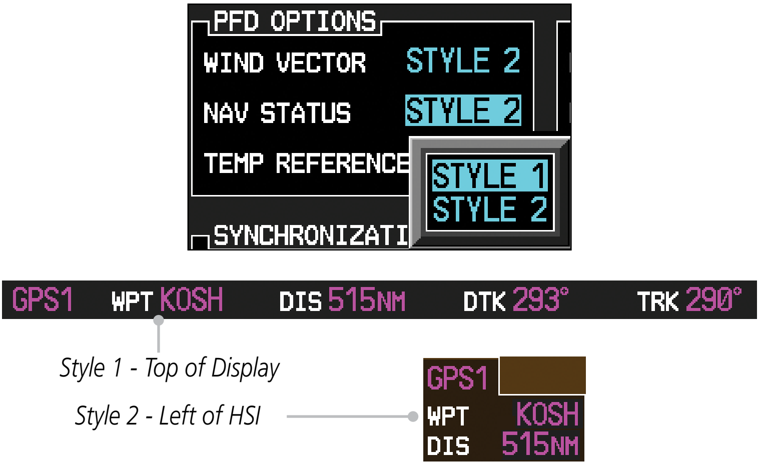
3) When a Wind Vector style is selected, a Wind Vector box with the chosen style will be displayed to the left of the HSI on the PFD. When OFF is selected, the Wind Vector box will not be displayed.

3.2.1.4 PFD Options - Nav Status

When selected, Nav Status information is displayed on the PFD either on the top of the display (Style 1) or to the left of the HSI (Style 2).

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the desired Nav Status value.

2) Turn the small **MFD** knob to select the style and press **ENT**.



PFD OPTIONS
WIND VECTOR STYLE 2
NAV STATUS STYLE 2
TEMP REFERENCE
SYNCHRONIZATI
STYLE 1
STYLE 2

GPS1 WPT KOSH DIS 515NM DTK 293° TRK 290°

GPS1
WPT KOSH
DIS 515NM

Figure 3-43 Nav Status Style

3) After the Nav Status style is selected, the chosen style will be displayed on the PFD.

***NOTE:** Nav Status option is not available for all installations.*

3.2.1.5 Temperature Reference

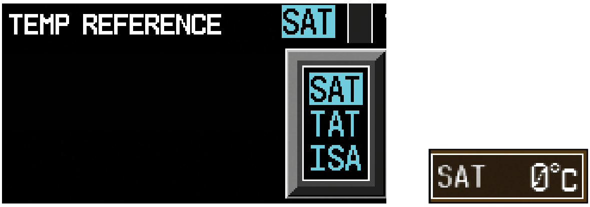
The computer calculates the temperature based on temperature probe and pitot/static inputs. The units (°C or °F) and temperature reference are selected on the AUX – SYSTEM SETUP page. The temperature reference can be selected to one of the following choices:

- Static Air Temperature (SAT) – This is the calculated temperature of the stationary (static) outside air. Conceptually, this is the temperature that would be read on a thermometer floating stationary at the current location.
- Total Air Temperature (TAT) – This is the calculated temperature of the outside air as it moves past the aircraft, including the rise in temperature due to air compression and friction at the current airspeed.

- Difference from International Standard Atmosphere (ISA) – This is the difference between SAT and standard (ISA) temperature at the current altitude. This provides an indication of how much warmer/colder the temperature is from a “standard” atmosphere.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the desired Temp Reference value.

2) Turn the small **MFD** knob to select the Temp Reference type and press **ENT**.


TEMP REFERENCE SAT

SAT 0°C

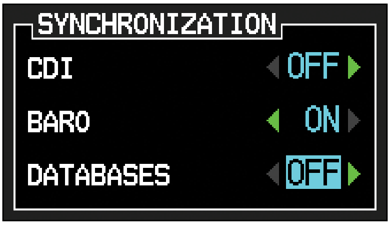
Figure 3-44 Outside Air Temperature Selection

3.2.1.6 Synchronization (Dual Installations Only)

Dual GDU 620 units when connected in the aircraft may be set up to communicate and share information by “Crossfilling” or synchronizing information between the two units.

Crossfill synchronization for CDI and Baro Corrections are selected in the System Setup page of the Aux page group. Database Synchronization is managed in the DB Sync function on the System Status page of the Aux page group.

1) While viewing the first page of the AUX page group, press the small **MFD** knob and turn the large **MFD** knob to highlight “CDI,” “BARO,” or “Databases” in the “Synchronization” box in both units.


SYNCHRONIZATION

CDI OFF

BARO ON

DATABASES OFF

Figure 3-45 Dual Unit Synchronization

2) Turn the small **MFD** knob to select “ON” or “OFF.”

3) Press **ENT**.

The following information is always synchronized between both GDU 620 units:

- Selected Altitude
- Selected Heading
- Selected Course
- Selected Vertical Speed
- Airspeed Bug Values
- Airspeed Color Band Values
- System Pressure Units
- System Temperature Units

The following information can be synchronized between GDU 620s, or changed independently, depending on the Crossfill Synchronization Settings:

- Barometric Correction (default ON)
- Selected CDI (default OFF)

When Barometric Correction is synchronized, any changes to the Barometric Setting on either GDU will change it on both GDUs.

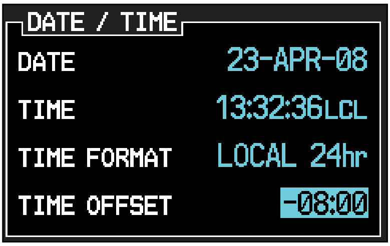
When the CDI is synchronized, any changes to the selected CDI on either GDU will change it on both GDUs. Either pilot can change the OBS course on either GPS. If the pilot selects GPS1 on the CDI and GPS1 is in OBS mode, any course changes will move the OBS on GPS1, GDU1, and GDU2 (if the copilot has GPS1 displayed on the CDI). Similarly, if the pilot selects GPS2 on the CDI and GPS2 is in OBS mode, any course changes will move the OBS on GPS2, GDU1, and GDU2 (if the copilot has GPS2 displayed on the CDI).

AHRS 1 and ADC 1 will only be displayed on GDU1. AHRS2 and ADC2 will only be displayed on GDU2.

The **CDI** soft key toggles between selection of GPS or VOR/LOC as the active navigation source. In a single GDU 620 system, the GDU **CDI** soft key will change the source in the connected navigator and making a source change in the navigator will be reflected in the GDU 620. In a dual GDU 620 system, the **CDI** keys in the navigator are disabled.

3.2.1.7 Date and Time

The Date and Time options allow you to select the time to change UTC time to local time with a time offset.



DATE / TIME
DATE 23-APR-08
TIME 13:32:36LCL
TIME FORMAT LOCAL 24hr
TIME OFFSET -08:00

Figure 3-46 Time Format and Offset

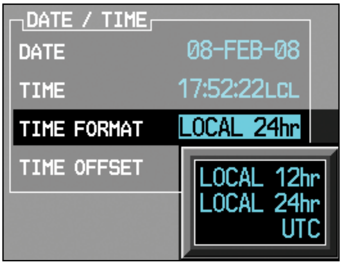
Time Zone	Local Standard Time Offset	Local Daylight Savings Time Offset
Atlantic	-4 hours	-3 hours
Eastern	-5 hours	-4 hours
Central	-6 hours	-5 hours
Mountain	-7 hours	-6 hours
Pacific	-8 hours	-7 hours
Alaskan	-9 hours	-8 hours
Hawaiian	-10 hours	-9 hours

Table 3-6 U.S. Time Zone Offsets

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight "Time Format."

2) Turn the small **MFD** knob to select Local 12hr, Local 24hr, or UTC and then press **ENT**. When Local 12 or 24 hour mode is selected, the Time Offset value will then be highlighted.

3) Turn the small **MFD** knob to select the desired offset and then press **ENT**.



DATE / TIME

DATE 08-FEB-08

TIME 17:52:22LCL

TIME FORMAT LOCAL 24hr

TIME OFFSET

Figure 3-47 Date and Time Values

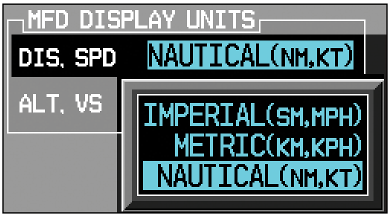
4) A Time Offset may be entered by using the large and small **MFD** knobs to change the values. Press **ENT** after completing any changes.

5) Press the small **MFD** knob to exit adjustments.

3.2.1.8 MFD Display Units

The MFD Display Units options allow you to select the units of measurement conventions displayed on the MFD. Distance and Speed selections are Imperial, Metric, or Nautical. Altitude and Vertical speed selections are Feet or Meters. Traffic information is always shown in Nautical Miles (distance) and Feet (altitude).

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the Distance and Speed (DIS, SPD) units of measurement.



MFD DISPLAY UNITS

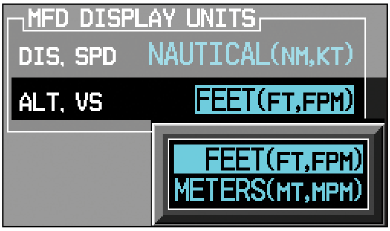
DIS, SPD NAUTICAL(NM,KT)

ALT, VS

Figure 3-48 Distance and Speed MFD Display Units

2) Turn the small **MFD** knob to select Imperial, Metric, or Nautical and then press **ENT**. The Altitude and Vertical Speed units selection will now be highlighted.

3) Turn the small **MFD** knob to select Feet or Meters and then press **ENT**.



MFD DISPLAY UNITS
DIS, SPD NAUTICAL(NM,KT)
ALT, VS FEET(FT,FPM)

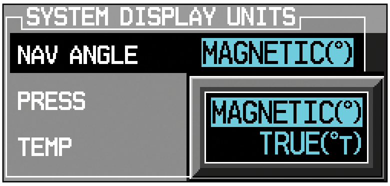
Figure 3-49 Altitude and Vertical Speed MFD Display Units

3.2.1.9 System Display Units

The System Display Units options allows the selection of units to display values for Navigation Angle (Magnetic or True), Barometric Setting (inches or Hectopascals), and Temperature (Fahrenheit or Celsius). Pressing the **DFLT UNIT** soft key will restore the Default Unit settings.

1) While viewing the System Setup page of the AUX page group, press the small **MFD** knob to activate the cursor. Turn the large **MFD** knob to highlight the System Display Units selection titled “Nav Angle.”

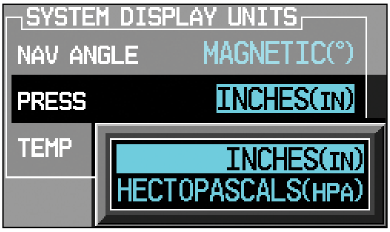
CAUTION: *The Nav Angle display units (Magnetic or True) must be set to the same type in both the GDU 620 and GPS navigators.*



SYSTEM DISPLAY UNITS
NAV ANGLE MAGNETIC(°)
PRESS
TEMP

Figure 3-50 Nav Angle System Display Units

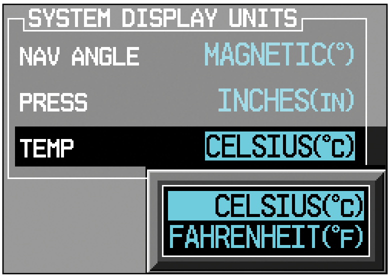
2) Turn the small **MFD** knob to select Magnetic or True and then press **ENT**. The Barometric Pressure Setting value will now be highlighted. When True is selected, a "T" will appear to the right of the heading value on the PFD.



SYSTEM DISPLAY UNITS
NAV ANGLE MAGNETIC(°)
PRESS INCHES(IN)
TEMP

Figure 3-51 Barometric Setting System Display Units

3) Turn the small **MFD** knob to select the Barometric Setting units and then press **ENT**. The Temperature value will now be highlighted.



SYSTEM DISPLAY UNITS
NAV ANGLE MAGNETIC(°)
PRESS INCHES(IN)
TEMP CELSIUS(°C)

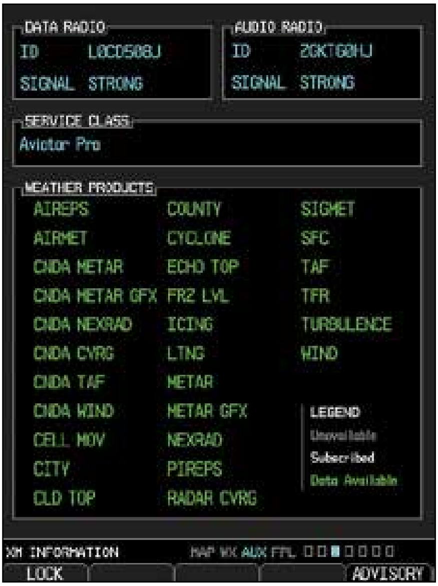
CELSIUS(°C)
FAHRENHEIT(°F)

Figure 3-52 Temperature System Display Units

4) Turn the small **MFD** knob to select the Temperature units and then press **ENT**.

3.2.2 Sirius XM Satellite Radio XM Information (Optional)

The Aux mode XM Information page displays information about the Sirius XM Satellite radios, service, and products when the GDL 69/69A is installed and the Sirius XM Satellite Radio service is activated.



DATA RADIO
ID L0CD508J
SIGNAL STRONG

AUDIO RADIO
ID ZGKTG0HJ
SIGNAL STRONG

SERVICE CLASS
Aviator Pro

WEATHER PRODUCTS
AIREPS
AIRMET
CNDA METAR
CNDA METAR GFX
CNDA NEXRAD
CNDA CVRG
CNDA TAF
CNDA WIND
CELL MOV
CITY
CLD TOP
COUNTY
CYCLONE
ECHO TOP
FRZ LVL
ICING
LTNG
METAR
METAR GFX
NEXRAD
PIREPS
RADAR CVRG
SIGMET
SFC
TAF
TFR
TURBULENCE
WIND
LEGEND
Unavailable
Subscribed
Data Available
XM INFORMATION
MAP WX AUX FPL
LOCK
ADVISORY

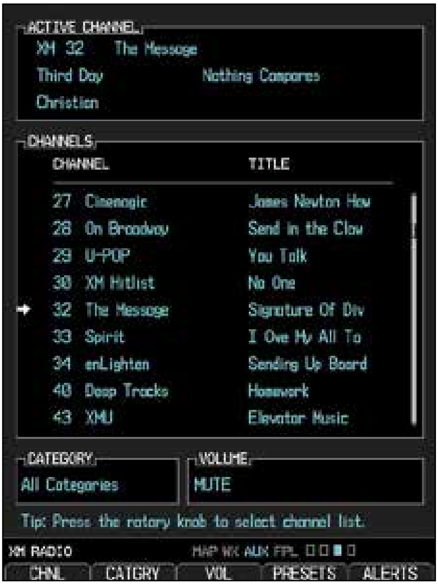
Figure 3-53 XM Information

3.2.3 Sirius XM Satellite Radio XM Entertainment Radio (Optional)

Audio entertainment is available through the Sirius XM Satellite Radio Service when activated in the optional installation of the GDL 69A. The GDU 620 serves as the display and control head for your remotely mounted GDL 69A. Sirius XM Satellite Radio allows you to enjoy a variety of radio programming over long distances without having to constantly search for new stations. Based on signal from satellites, coverage far exceeds land-based transmissions. When enabled, the Sirius XM Satellite Radio audio entertainment is accessible in Aux Mode.

The information on the Sirius XM Satellite Radio display is composed of four areas: the Active Channel, Available Channels, Category of the highlighted Channel, and the Volume setting. The Active Channel window shows the Channel Name and Number, Artist, Song Title, and Category.

1) Turn the large **MFD** knob to the AUX page group.
2) Turn the small **MFD** knob to the XM Radio page.



XM 32 The Message
Third Day Nothing Compares
Christian

CHANNEL	TITLE
27 Cinemagic	James Newton How
28 On Broadway	Send in the Clow
29 U-POP	You Talk
30 XM Hitlist	No One
➡ 32 The Message	Signature Of Div
33 Spirit	I Owe My All To
34 enLighten	Sending Up Board
40 Deep Tracks	Homework
43 XMU	Elevator Music

All Categories

MUTE

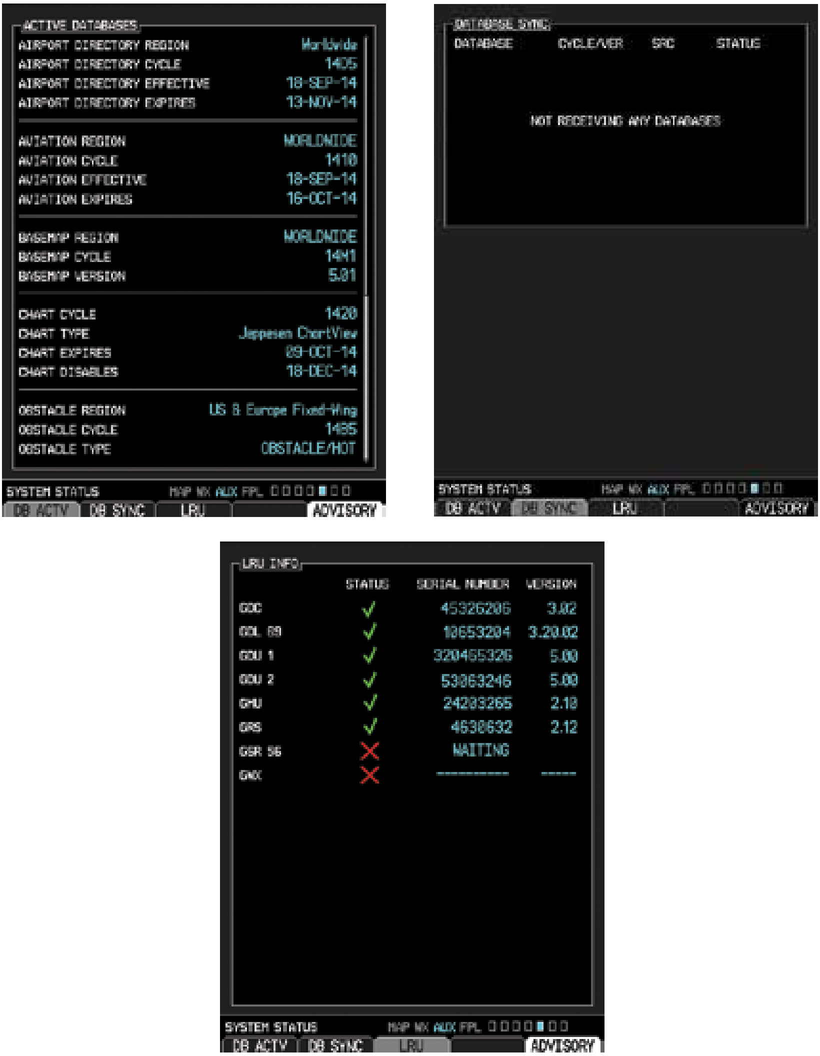
Tip: Press the rotary knob to select channel list.

Figure 3-54 XM Entertainment Radio

A description of Sirius XM Satellite Radio audio entertainment is provided in Section 5 - Additional Features.

3.2.4 System Status

The System Status Page displays the statuses, serial numbers, and software version numbers for all detected system LRUs. Pertinent information on all system databases is also displayed. Active LRUs are indicated by green check marks; failed LRUs by red "X's." Failed LRUs should be noted and a service center or Garmin-authorized dealer informed. Database SYNC allows a database to be synchronized with more than two LRUs (G500/600 and GTNs) at once.



ACTIVE DATABASES

AIRPORT DIRECTORY REGION	Worldwide
AIRPORT DIRECTORY CYCLE	1405
AIRPORT DIRECTORY EFFECTIVE	18-SEP-14
AIRPORT DIRECTORY EXPIRES	13-NOV-14
AVIATION REGION	WORLDWIDE
AVIATION CYCLE	1410
AVIATION EFFECTIVE	18-SEP-14
AVIATION EXPIRES	16-OCT-14
BASEMAP REGION	WORLDWIDE
BASEMAP CYCLE	1441
BASEMAP VERSION	5.01
CHART CYCLE	1420
CHART TYPE	Jeppesen ChartView
CHART EXPIRES	09-OCT-14
CHART DISABLES	18-DEC-14
OBSTACLE REGION	US & Europe Fixed-Wing
OBSTACLE CYCLE	1405
OBSTACLE TYPE	OBSTACLE/HOT

DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS

NOT RECEIVING ANY DATABASES

LRU INFO

	STATUS	SERIAL NUMBER	VERSION
GDC	✓	45326206	3.02
GDL 69	✓	10653204	3.20.02
GDU 1	✓	320465326	5.00
GDU 2	✓	53063246	5.00
GMU	✓	24203265	2.10
GRS	✓	4630632	2.12
GSR 56	✗	WAITING	
GWX	✗	----------	-----

Figure 3-55 LRU and Database Information

1) Turn the large **MFD** knob to the AUX page group.

2) Turn the small **MFD** knob to the System Status page.

3) Press the **LRU** soft key to highlight the first item in the LRU Info window.

4) Turn the small **MFD** knob to scroll through the items in the LRU Info window in case more items are available than are displayed. If more items are available than can be displayed in the window, a scroll bar will show on the right side of the window.

5) Press the **DB ACTV** soft key to display the active databases.

6) Press the **DB SYNC** soft key to display the status of Database SYNC operations. The synchronization happens automatically regardless of whether the soft key is used.

3.2.4.1 Database Sync Operation

Database SYNC allows the G500/600 to synchronize databases from a single unit. The pilot only needs to update a single database card and the new databases are automatically SYNC'd through the units connected in the cockpit and configured for Database Syncing.

The following databases can be synchronized between using Database SYNC:

- Navigation
- Obstacle
- SafeTaxi
- Airport Directory
- Chartview (when support is added by Jeppesen)
- FliteCharts
- Basemap

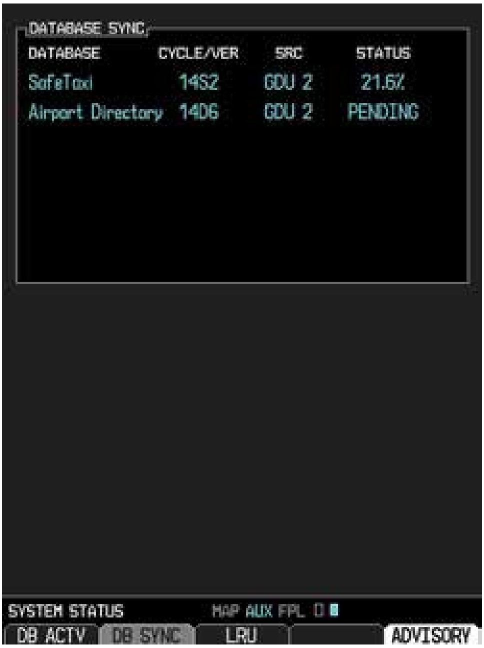
When Database SYNC is enabled in the LRUs and a database card is inserted that is created for Database SYNC, the G500/600 will coordinate with the other LRUs in the cockpit to determine which unit has the newest databases. Once the determination has occurred, the connected LRUs will begin to transfer the databases. This process may take several minutes. Charts are meant to be transferred while in-flight, before the new chart database is effective, as this could take an hour or more. The status of the database transfers to a unit can be viewed in the System Status function on the DB SYNC page. The G500/600 will display the source of the received databases. If a database transfer is pending, completed, or not authorized, the status will also be indicated.

When the transfer is complete, if there are new and current databases to be used, and if the aircraft is stopped and has yet to take-off, the pilot will be prompted with the option to restart the unit that has the new databases transferred to it. During the restart process, the unit may prompt you to update (transfer from the card to the unit's memory) to the newer databases so they can be used. Only the aviation database will require a prompt, all the others will switch during a restart without a prompt.

NOTE: *This feature is available in SW Versions 7.00, and later.*

NOTE: *Restarting the G500/600 must only be performed when the aircraft is on the ground as navigation and communication from the restarted unit will be lost for a period of time.*

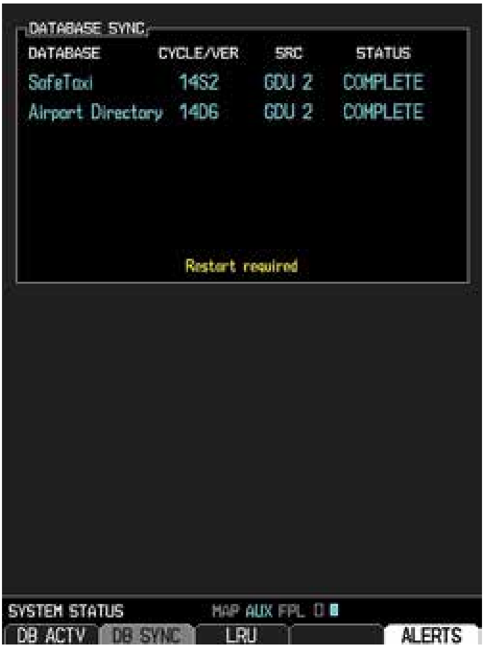
1. With the G500/600 turned off, insert the database card.
2. Turn the G500/600 on. The Database SYNC will occur automatically in the background. During the Database SYNC process, normal operation of the G500/600 is not affected.
3. On the System Status page, press the **DB SYNC** soft key to view the transfer process.



DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS
SafeTaxi	1452	GDU 2	21.6%
Airport Directory	1406	GDU 2	PENDING

Figure 3-56 One Database Transfer In Process and One Pending



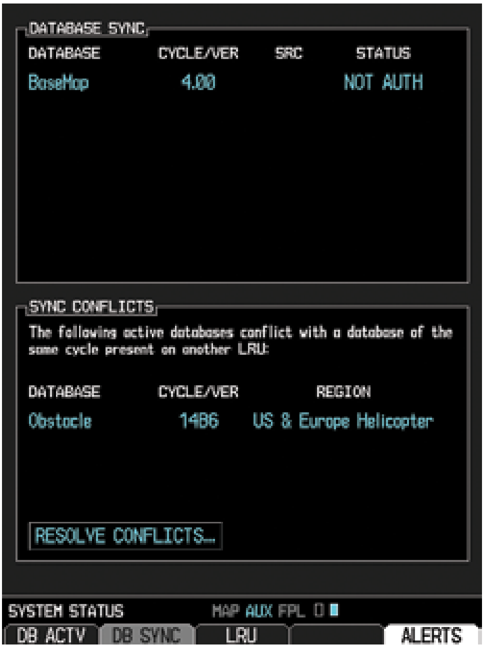
DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS
SafeTaxi	14S2	GDU 2	COMPLETE
Airport Directory	14D6	GDU 2	COMPLETE

Restart required

SYSTEM STATUS
MAP AUX FPL
DB ACTV
DB SYNC
LRU
ALERTS

Figure 3-57 Database Transfer Complete



DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS
BaseMap	4.00		NOT AUTH

SYNC CONFLICTS

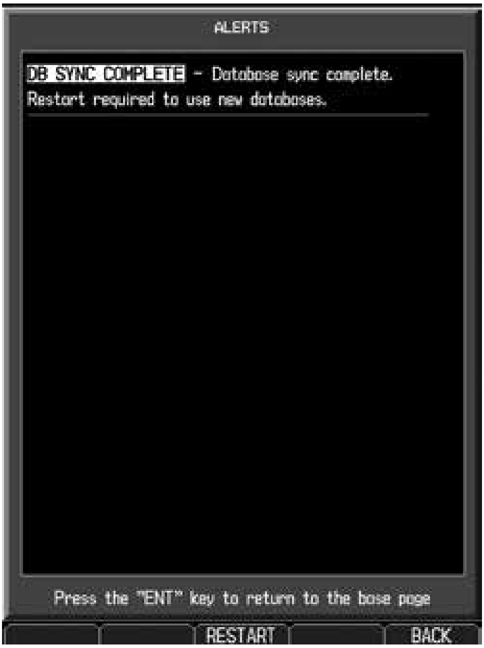
The following active databases conflict with a database of the same cycle present on another LRU:

DATABASE	CYCLE/VER	REGION
Obstacle	14B6	US & Europe Helicopter

RESOLVE CONFLICTS...
SYSTEM STATUS
MAP AUX FPL
DB ACTV
DB SYNC
LRU
ALERTS

Figure 3-58 Database Transfer Not Authorized and DB Sync Conflict

4. Once all of the database transfers have completed, if the G500/600 determines that at least one of the newly transferred databases is effective and the aircraft is on the ground and stopped prior to a flight, a pop-up and confirmation will be presented to restart the unit. No pop-up will appear if the aircraft is moving or has been in the air since the unit was turned on.
5. Press the **Restart** soft key to continue updating the database.



DB SYNC COMPLETE - Database sync complete. Restart required to use new databases.

Press the "ENT" key to return to the base page

Figure 3-59 System Restart - Step 1

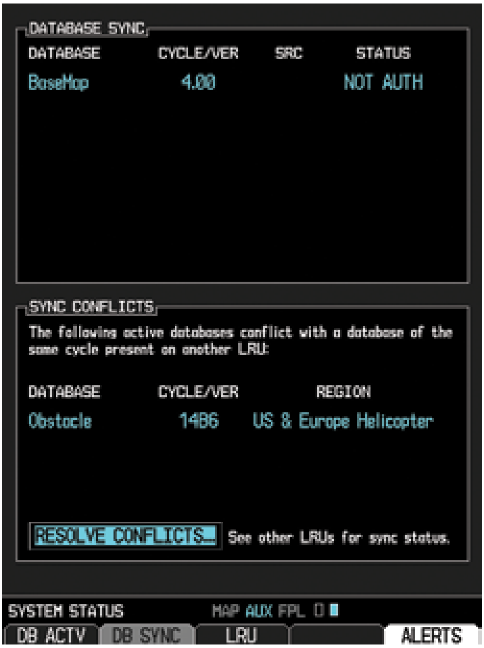
***WARNING:** The unit will reset and all GPS navigation and moving map functions may be lost while the unit regains GPS position.*

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

3.2.4.2 Resolving Database Conflicts

If the G500/600 determines that there are multiple LRUs with the newest cycle of a database, but they have different regions or types of that database (i.e.; Fixed-wing vs. Rotorcraft navigation database, different regions of the navigation database, or different obstacle database types) then a database conflict will occur. When a database conflict occurs, that database will not be SYNC'd until the pilot resolves the conflict. Initiate the resolve conflicts function on the unit that contains the databases which the pilot wishes to use. These databases will then be sent to other units.

1. Press the **DB SYNC** soft key, and then select the **Resolve Conflicts** function on the LRU with the desired databases.



DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS
BaseMap	4.00		NOT AUTH

SYNC CONFLICTS

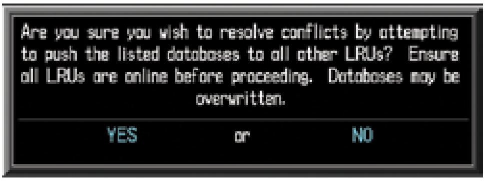
The following active databases conflict with a database of the same cycle present on another LRU:

DATABASE	CYCLE/VER	REGION
Obstacle	14B6	US & Europe Helicopter

RESOLVE CONFLICTS... See other LRUs for sync status.

Figure 3-60 Database Conflicts

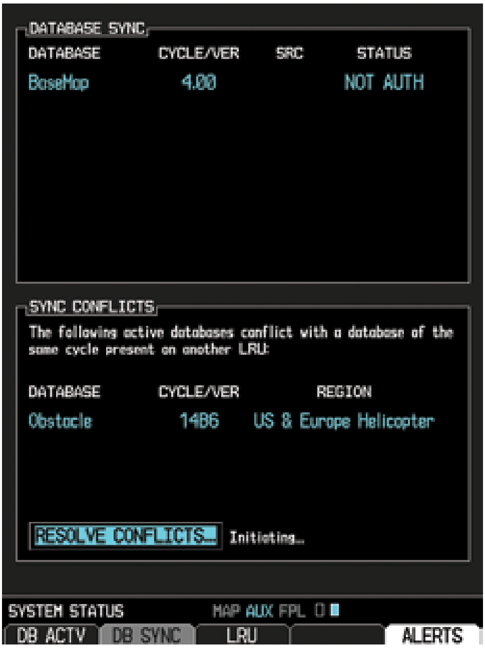
2. Select **YES** to continue and push the database to all other LRUs.



Are you sure you wish to resolve conflicts by attempting to push the listed databases to all other LRUs? Ensure all LRUs are online before proceeding. Databases may be overwritten.

Figure 3-61 Confirm Database Sync

3. Once sync'd, the desired database will be SYNC'd to the other LRUs and "Initiating" will be displayed on the **Sync Conflicts** window.



DATABASE SYNC

DATABASE	CYCLE/VER	SRC	STATUS
BaseMap	4.00		NOT AUTH

SYNC CONFLICTS

The following active databases conflict with a database of the same cycle present on another LRU:

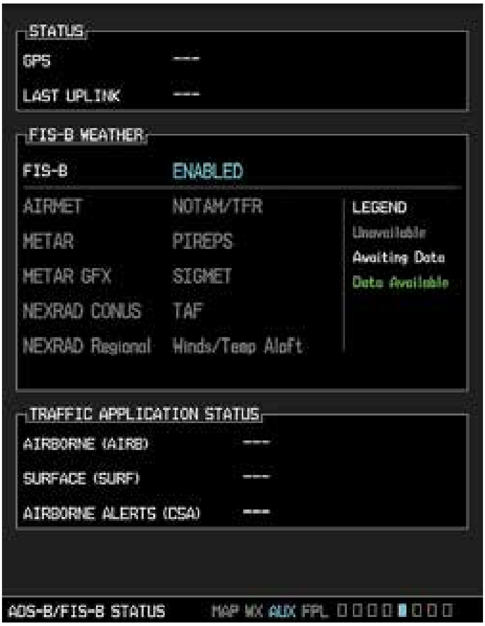
DATABASE	CYCLE/VER	REGION
Obstacle	1486	US & Europe Helicopter

RESOLVE CONFLICTS... Initiating...

Figure 3-62 Database Conflicts Resolved (Initiating)

3.2.5 ADS-B/FIS-B Status (optional)

When the optional GDL88 is installed, the ADS-B/FIS-B Status page will show the status of satellite communications, FIS-B weather products, and the traffic applications.



STATUS
GPS ---
LAST UPLINK ---

FIS-B WEATHER
FIS-B ENABLED
AIRMET
NOTAM/TFR
METAR
PIREPS
METAR GFX
SIGMET
NEXRAD CONUS
TAF
NEXRAD Regional
Winds/Temp Aloft

LEGEND
Unavailable
Awaiting Data
Data Available

TRAFFIC APPLICATION STATUS
AIRBORNE (AIRB) ---
SURFACE (SURF) ---
AIRBORNE ALERTS (CSA) ---

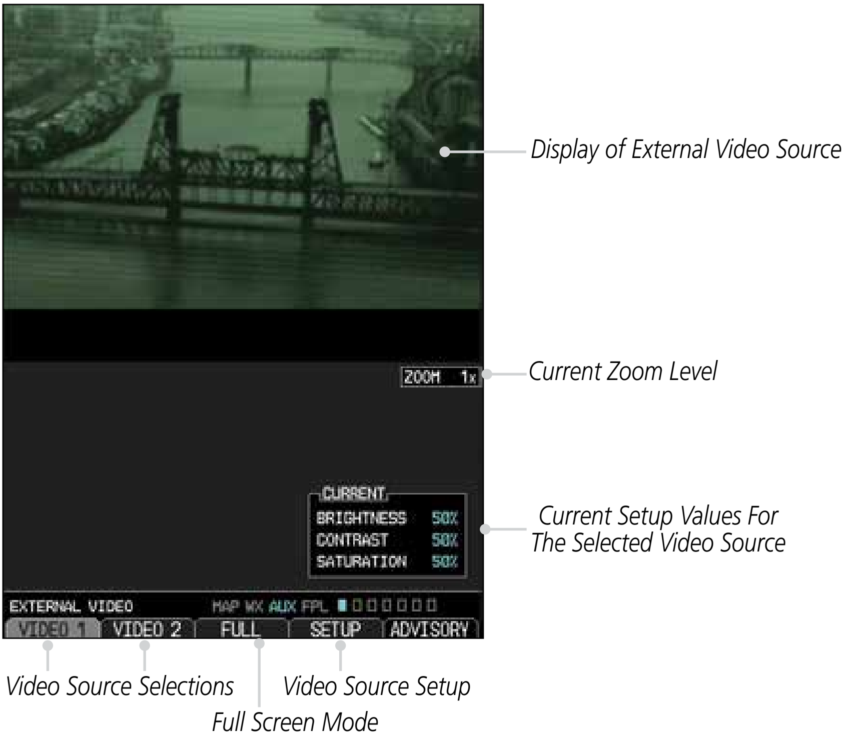
Figure 3-63 ADS-B/FIS-B Status Page

3.2.6 External Video (optional)

External Video is an optional function that displays video provided by an externally mounted video source on the aircraft.

1) Turn the large **MFD** knob to the Aux page group.

2) The External Video page is the first page in the Aux page group.


Display of External Video Source
ZOOM 1x
Current Zoom Level
Current Setup Values For The Selected Video Source
EXTERNAL VIDEO
MAP WX AUX FPL
VIDEO 1
VIDEO 2
FULL
SETUP
ADVISORY
Video Source Selections
Video Source Setup
Full Screen Mode

CURRENT
BRIGHTNESS 50%
CONTRAST 50%
SATURATION 50%

Figure 3-64 External Video

3.2.6.1 Select Video Source

If more than one video source is available, the **Video 1** and **Video 2** soft keys will be available at the bottom of the display.

1) Press the **Video 1** soft key to select Video 1 source for viewing and setup.

2) Press the **Video 2** soft key to select Video 2 source for viewing and setup.

3.2.6.2 Zoom

1) While viewing the External Video function, press the **Up Rng Arrow** key to increase the zoom up to 10x magnification. Zoom level is made through digital magnification.

2) Press the **Down Rng Arrow** key to decrease the zoom level down to a minimum of 1x.

3) Pressing the **FULL** soft key toggles between a half and full page view.

3.2.6.3 Panning

1) While viewing the External Video function, press the small **MFD** knob to activate panning.

2) Turn the small **MFD** knob clockwise to pan up (the map will move down).

3) Turn the small **MFD** knob counterclockwise to pan down (the map will move up).

4) Turn the large **MFD** knob clockwise to pan to the right (the map will move left).

5) Turn the large **MFD** knob counterclockwise to pan to the left (the map will move right).

6) Press the small **MFD** knob to exit panning.

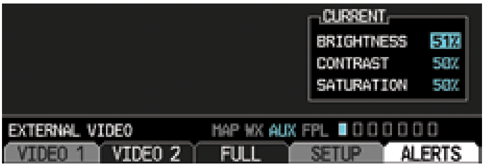
3.2.6.4 Setup

The display of each video source is set up individually.

1) While viewing the External Video page, press the soft key for the desired Video source (**Video 1** or **Video 2**).

2) Press the **Setup** soft key.

3) The Current value for Brightness will be selected. Use the following directions for each value.



CURRENT
BRIGHTNESS 51%
CONTRAST 50%
SATURATION 50%

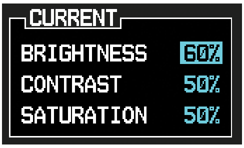
Figure 3-65 External Video Setup

4) After selecting the desired settings, press the small **MFD** knob or the **Setup** soft key to exit editing.

Brightness Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the small **MFD** knob to adjust the Brightness value.



CURRENT
BRIGHTNESS 60%
CONTRAST 50%
SATURATION 50%

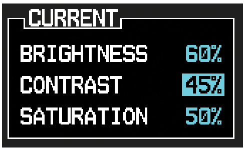
Figure 3-66 External Video Brightness Adjustment

3) After selecting the desired setting, turn the large **MFD** knob to highlight the next value or press the small **MFD** knob to exit editing.

Contrast Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the large **MFD** knob to highlight the Contrast value. Turn the small **MFD** knob to adjust the Contrast value.



CURRENT
BRIGHTNESS 60%
CONTRAST 45%
SATURATION 50%

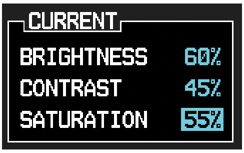
Figure 3-67 External Video Contrast Adjustment

3) After selecting the desired setting, turn the large **MFD** knob to highlight the next value or press the small **MFD** knob to exit editing.

Saturation Adjustment

1) While viewing the External Video page and the desired Video source, press the **Setup** soft key.

2) The Current value for Brightness will be selected. Turn the large **MFD** knob to highlight the Saturation value. Turn the small **MFD** knob to adjust the Saturation value.



BRIGHTNESS 60%
CONTRAST 45%
SATURATION 55%

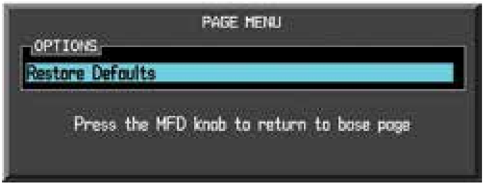
Figure 3-68 External Video Saturation Adjustment

3) After selecting the desired setting, press the small **MFD** knob to exit editing.

3.2.6.5 Restore Defaults

The Restore Defaults selection will return the Brightness, Contrast, and Saturation values to their original settings.

1) While viewing the External Video page, press the **MENU** key.



Press the MFD knob to return to base page

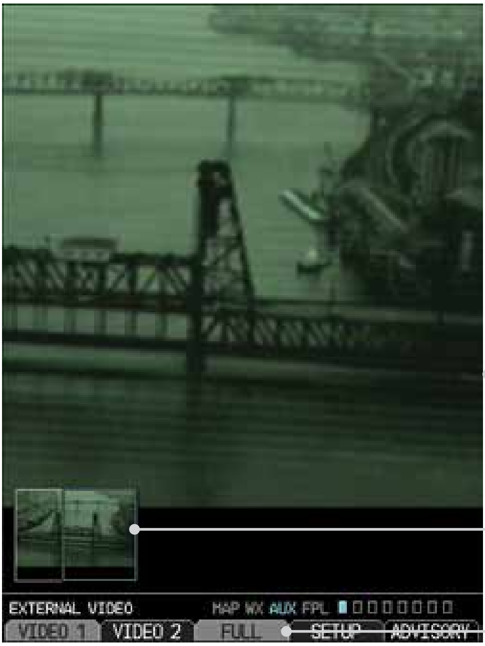
Figure 3-69 Restore Video Defaults Menu Selection

2) "Restore Defaults" will be highlighted. Press the **ENT** key.

3.2.6.6 Full Screen

The Full selection allows selection of the part of the video information for display.

1) While viewing the External Video page, press the **FULL** key.



Selected Display Area

Window of the Selected Display Area

Full Screen Mode

Figure 3-70 Full Video Selection

2) Press the small **MFD** knob to activate the selection window.

3) Turn the large **MFD** key to move the selection window.

4) Press the small **MFD** knob to accept the selected display area shown in the window.

3.2.7 Position Reporting (optional)

Position Reporting is a system which collects system variables and transmits them over the Iridium® satellite at a given interval through the GSR 56.

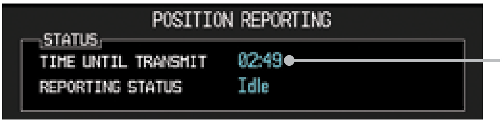
3.2.7.1 Status

The Status window shows the time until the next data transmission and the status of the reporting system.

***NOTE:** The GSR 56 does not report its serial number until 90 seconds after power up of the GDU. As a result, for that period, the product info for the GSR 56 will show "Waiting."*

Time Until Transmit

The Time Until Transmit field is a countdown timer that shows the time until the next data transmission. This field is blank when the aircraft is on the ground.



POSITION REPORTING
STATUS
TIME UNTIL TRANSMIT 02:49
REPORTING STATUS Idle

Countdown Time Until Transmit

Figure 3-71 Position Reporting Time Until Transmit

Position Reporting Status

Position Reporting will be enabled when the aircraft is in the air.

Status	Description
Idle	The reporting system is not using the GSR 56 for reporting at this time.
Initializing	The GSR 56 and its driver are currently initializing.
Transferring	A position report is currently being transmitted.
Unavailable	The GSR 56 is currently not usable by the reporting system.

Table 3-7 Position Reporting Status

3.2.7.2 Report Type

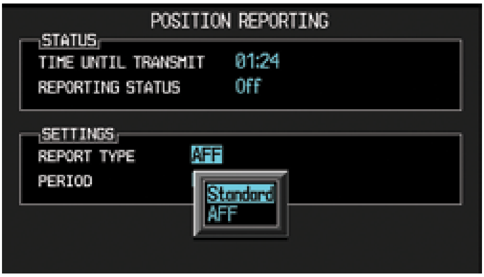
Standard

When the Standard reporting type is used, the Position Reporting Period may be set to Off or Automatic. The Automatic Position Reporting Period can be set to intervals of 2 to 60 minutes.

1) Turn the large **MFD** knob to reach the Aux page group. Turn the small **MFD** knob to reach the Position Reporting page.

2) Press the small **MFD** knob to select the Report Type.

3) Turn the small **MFD** knob to highlight Standard and then press the **ENT** key.

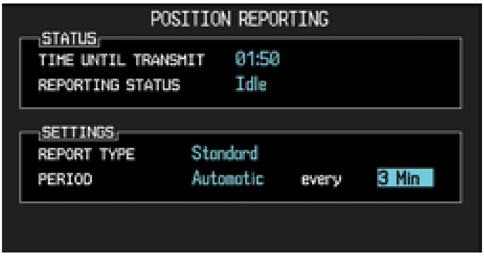


POSITION REPORTING
STATUS
TIME UNTIL TRANSMIT 01:24
REPORTING STATUS Off
SETTINGS
REPORT TYPE AFF
PERIOD
Standard
AFF

Figure 3-72 Select Standard Reporting

4) The Position Reporting Period type will now be selected. Turn the small **MFD** knob to highlight "Off" or "Automatic" and then press the **ENT** key. The Position Reporting Period interval will now be selected.

5) Turn the small **MFD** knob to select the reporting frequency.



POSITION REPORTING
STATUS
TIME UNTIL TRANSMIT 01:50
REPORTING STATUS Idle
SETTINGS
REPORT TYPE Standard
PERIOD Automatic every 3 Min

Figure 3-73 Select Standard Reporting Period Frequency

6) Press the small **MFD** knob to exit editing.

7) With the Standard Reporting Type, the reporting period may be manually overridden by pressing the **SEND** soft key to send data.

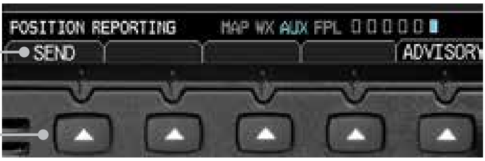


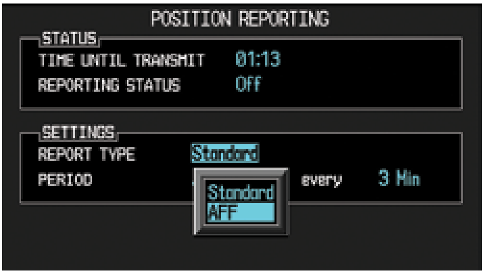
Figure 3-74 Press SEND to Override the Reporting Period

Automatic Flight Following (AFF)

The G500/600 system, when combined with a GSR 56 Iridium datalink, can send position reports that contain data as required by the U.S. Government Automated Flight Following system. The GSR 56 account will allow configuration to forward data to the Automated Flight Following system.

1) While viewing the Position Reporting function, press the small **MFD** knob to select the Report Type.

2) Turn the small **MFD** knob to highlight "AFF" and then press the **ENT.**



POSITION REPORTING

STATUS

TIME UNTIL TRANSMIT 01:13

REPORTING STATUS OFF

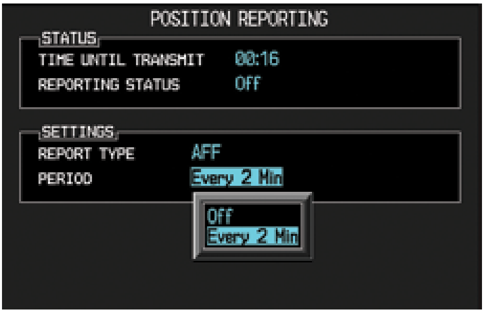
SETTINGS

REPORT TYPE Standard

PERIOD every 3 Min

Figure 3-75 Select Automatic Flight Following (AFF) Reporting Type

3) Turn the small **MFD** knob to select "OFF" or the default "Every 2 Min" value.



POSITION REPORTING

STATUS

TIME UNTIL TRANSMIT 00:16

REPORTING STATUS OFF

SETTINGS

REPORT TYPE AFF

PERIOD Every 2 Min

Figure 3-76 Select AFF Reporting Period Frequency

3.2.8 Iridium Phone Operation (Optional)

Optional satellite telephone operation is available through the Iridium® satellite system that is interfaced through the Garmin GSR 56.

⚠ ***CAUTION:** When interfaced with a GSR 56 Iridium transceiver only one SD card may be present in the GDU 620 and it must be in the lower slot.*

3.2.8.1 Status

The Status section shows the Call Time, Phone Status, and Call Suppression selected. The Call Time value shows the length of the call time for the current call using the Iridium phone. Phone Status shows the current operating status of the Iridium phone.

Status	Description
Idle	The Iridium phone is not using the GSR 56 for communicating at this time.
Initializing	The GSR 56 and its driver are currently initializing.
Connected	The GSR 56 is connected to the called number.
Connecting Call	The GSR 56 is in the process of connecting to the called number.
Changing Volume	The volume level on the GSR 56 is changing.
Busy	The phone is in use by another service and the call may not be made.
Dialing	The GSR 56 is dialing the called number.
Incoming Call	A call is being made to the GSR 56.
Hanging Up	The GSR 56 is disconnecting from the current call.
Unavailable	The GSR 56 is currently not usable by the Iridium phone system.

Table 3-8 Iridium Phone Status

Call Suppression controls calling when use of the Iridium phone system is allowed.

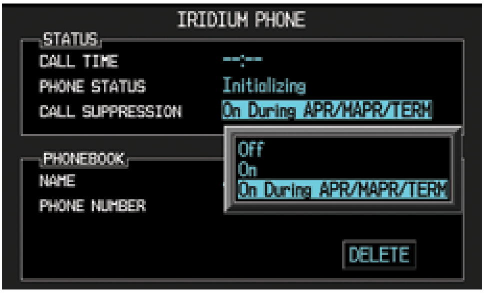
1) Turn the large **MFD** knob to reach the Aux page group. Turn the small **MFD** knob to reach the Iridium Phone page.

2) Press the small **MFD** knob to select the Call Suppression type.

Status	Description
Off	Call Suppression is turned off. Calls may be transmitted and received through the Iridium phone.
On	Call Suppression is turned on. The incoming call pop-up will not be shown. The call may still be answered on the phone page. Outgoing calls are not affected.
On During APR/ MAPR/TERM	Call Suppression is turned on during Approach, Missed Approach, and Terminal operations. The incoming call pop-up will not be shown. The call may still be answered on the phone page. Outgoing calls are not affected.

Table 3-8 Call Suppression

3) Turn the small **MFD** knob to highlight the desired selection.



IRIDIUM PHONE

STATUS

CALL TIME --:--

PHONE STATUS Initializing

CALL SUPPRESSION On During APR/MAPR/TERM

PHONEBOOK

NAME

PHONE NUMBER

Figure 3-77 Select Call Suppression

4) Press the **ENT** key. Press the small **MFD** knob again to cancel the selection cursor.

3.2.8.2 Managing the Phone Book

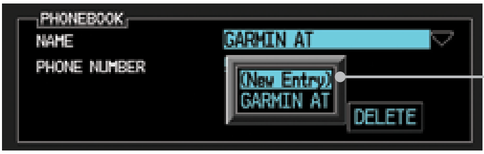
The Phone Book is stored on the SD card in the bottom slot. The Phone Book will only be available for use when the SD card is in the bottom slot. The Phone Book may hold up to 128 entries. A phone number may be entered and dialed without saving it to the Phone Book. Note that it is necessary to dial a "1," the area code, and then the number.

Creating Phone Number Names

1) Turn the large **MFD** knob to reach the Aux page group. Turn the small **MFD** knob to reach the Iridium Phone page.

2) Press the small **MFD** knob to activate the cursor and then turn the large **MFD** knob to highlight the Name item in the Phone Book. The Name field will blink.

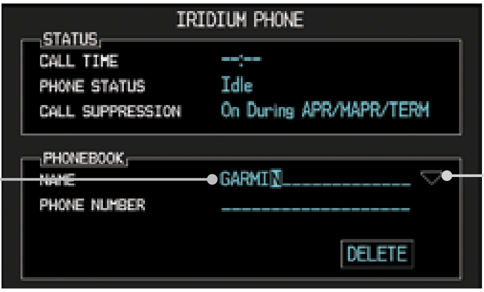
3) If items already exist in the catalog, turn the large **MFD** knob to select the Phone Book Catalog icon. Then, turn the small **MFD** knob to display the contents of the Phone Book Catalog and highlight the New Entry selection and press **ENT**.


PHONEBOOK
NAME GARMIN AT
PHONE NUMBER
(New Entry)
GARMIN AT
DELETE

"New Entry" Selected for Phone Book Catalog Entry

Figure 3-78 "New Entry" Selected for Phone Book Catalog Entry

4) Turn the small **MFD** knob to select the first character of the name and then turn the large **MFD** knob to select the next character. When the name is complete, press the **ENT** key.


IRIDIUM PHONE
STATUS
CALL TIME --:--
PHONE STATUS Idle
CALL SUPPRESSION On During APR/MAPR/TERM
PHONEBOOK
NAME GARMIN___________
PHONE NUMBER ________________
DELETE

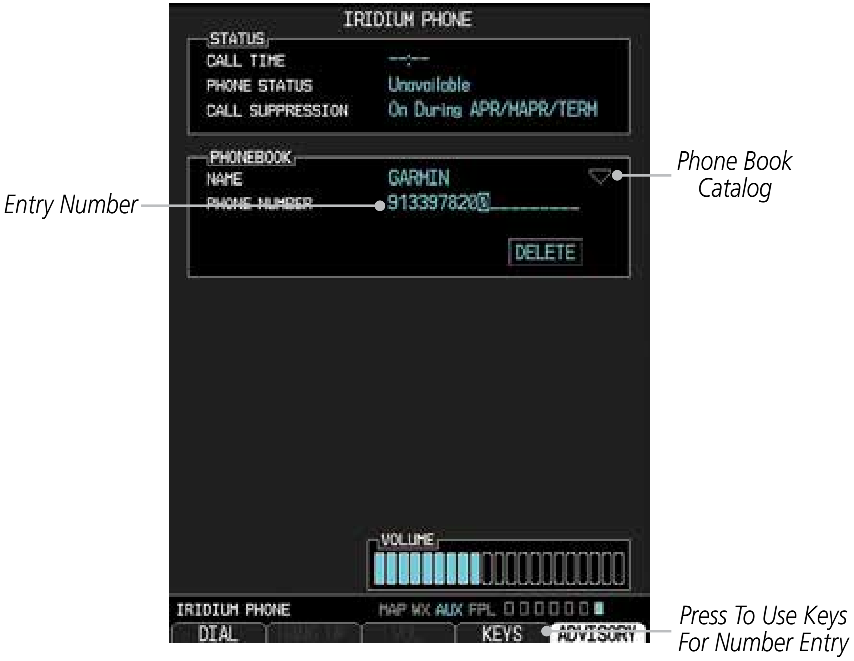
Entry Name

Phone Book Catalog

Figure 3-79 Phone Book Name Entry

Creating Phone Numbers with the Rotary Knobs

1) Turn the large **MFD** knob to the Phone Number field. Turn the small **MFD** knob to select the first character of the number and then turn the large **MFD** knob to select the next character. When the number is complete, press the **ENT** key.


Entry Number
Phone Book Catalog
Press To Use Keys For Number Entry
IRIDIUM PHONE
STATUS
PHONEBOOK
DELETE
VOLUME
IRIDIUM PHONE
MAP WX AUX FPL
DIAL
KEYS
ADVISORY

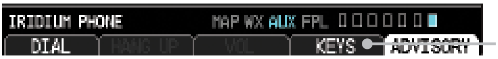
CALL TIME --:--
PHONE STATUS Unavailable
CALL SUPPRESSION On During APR/MAPR/TERM
NAME GARMIN
PHONE NUMBER 9133978200

Figure 3-80 Phone Book Number Entry

2) Press the small **MFD** knob again to cancel the selection cursor.

Creating Phone Numbers with Soft Keys

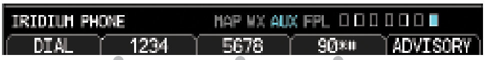
1) Numbers may also be entered using the soft keys at the bottom of the display. Press the **Keys** key at the bottom of the display.


IRIDIUM PHONE
MAP WX AUX FPL
DIAL
HANG UP
VOL
KEYS
ADVISORY

Press To Use Keys For Number Entry

Figure 3-81 Phone Book Number Entry Using Hot Keys

2) Press the key for the group of desired numbers.


IRIDIUM PHONE
MAP WX AUX FPL
DIAL
1234
5678
90*#
ADVISORY

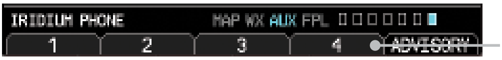
Press for numbers 1, 2, 3, and 4

Press for numbers 5, 6, 7, and 8

*Press for numbers 9 and 0, and symbols * and #*

Figure 3-82 Selecting Numeric Groups for Phone Book Number Entry

3) Press the key for the desired number. Repeat as necessary and then press **ENT** when the number is complete.

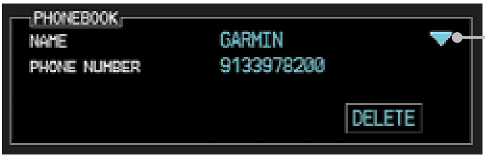

IRIDIUM PHONE
MAP WX AUX FPL
1
2
3
4
ADVISORY

Press Keys For Number Entry

Figure 3-83 Selecting Individual Numbers for Phone Book Number Entry

Selecting a Phone Book Catalog Entry

1) Press the small **MFD** knob to activate the cursor and then turn the large **MFD** knob to select the Phone Book Catalog icon.

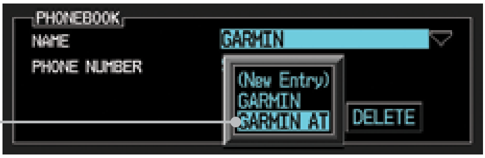

PHONEBOOK
DELETE

NAME GARMIN
PHONE NUMBER 9133978200

Phone Book icon. When Highlighted, turn small MFD knob to view list.

Figure 3-84 Selecting the Phone Book Catalog

2) Turn the small **MFD** knob to display the contents of the Phone Book Catalog and highlight the desired entry.


PHONEBOOK
NAME
PHONE NUMBER
GARMIN
(New Entry)
GARMIN
GARMIN AT
DELETE

Selected Phone Book Catalog Entry

Figure 3-85 Selected Phone Book Catalog Entry

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

3) Press the **ENT** key. Press the small **MFD** knob again to cancel the selection cursor.

Deleting a Phone Book Catalog Entry

1) Press the small **MFD** knob to activate the cursor and then turn the large **MFD** knob to select the Phone Book Catalog icon.

2) Turn the small **MFD** knob to display the contents of the Phone Book Catalog and highlight the desired entry. Press **ENT** to select the catalog entry.

3) Turn the large **MFD** knob to highlight the **DELETE** key. Press **ENT** to delete the catalog entry. Press the small **MFD** knob again to cancel the selection cursor.

Editing a Phone Book Catalog Entry

1) Press the small **MFD** knob to activate the cursor and then turn the large **MFD** knob to select the Phone Book Catalog icon.

2) Turn the small **MFD** knob to display the contents of the Phone Book Catalog and highlight the desired entry. Press **ENT** to select the catalog entry.

3) Use the large **MFD** and small **MFD** knobs to make changes to the name or number. Press **ENT** to save the changes. Press the small **MFD** knob again to cancel the selection cursor.

3.2.8.3 Phone Volume

Use the Phone Volume controls to adjust the loudness of the phone calls you hear. Volume controls will only be available when the Idle, Connected, or Changing Volume states are displayed.

Adjusting the Phone Volume with the Rotary Knobs

1) While viewing the Iridium Phone page, press the small **MFD** knob and then turn the large **MFD** knob to select the Volume control. The volume bar graph will blink when selected.

2) Turn the small **MFD** knob to set the desired volume level.

3) Press the **ENT** key. Press the small **MFD** knob again to cancel the selection cursor.

Adjusting the Phone Volume with the Soft Keys

1) While viewing the Iridium Phone page, press the **VOL** key at the bottom of the display.

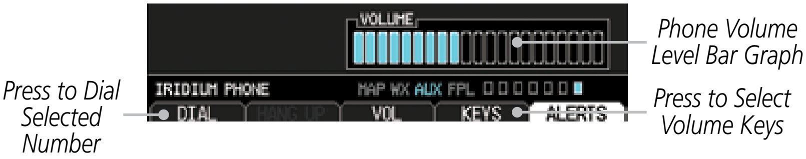

VOLUME
IRIDIUM PHONE
MAP WX AUX FPL
DIAL
HANG UP
VOL
KEYS
ALERTS
Phone Volume Level Bar Graph
Press to Dial Selected Number
Press to Select Volume Keys

Figure 3-86 Select Soft Keys for Phone Volume Adjustment

2) Press the **VOL +** or **VOL –** keys as necessary to adjust the phone volume.

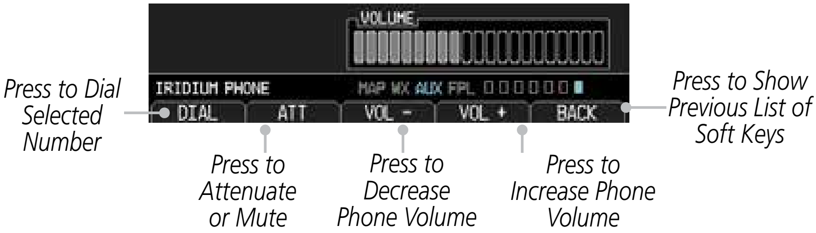

VOLUME
IRIDIUM PHONE
MAP WX AUX FPL
DIAL
ATT
VOL –
VOL +
BACK
Press to Dial Selected Number
Press to Show Previous List of Soft Keys
Press to Attenuate or Mute
Press to Decrease Phone Volume
Press to Increase Phone Volume

Figure 3-87 Using Soft Keys for Phone Volume Adjustment

3) Pressing the **ATT** soft key will attenuate the volume. Press the **ATT** soft key again to return to the previous volume.

3.2.8.4 Making a Phone Call

1) While viewing the Iridium Phone page, enter a phone number, or select one from the Phone Book catalog.

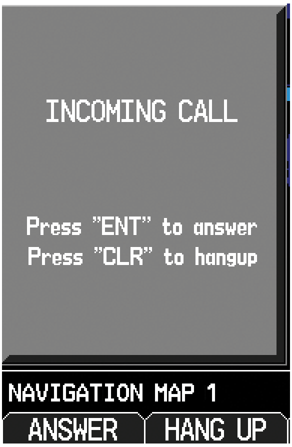
2) Press the **DIAL** key.

3) After completing the call, press the **HANG UP** key.

3.2.8.5 Answering a Phone Call

An incoming phone call will generate a pop-up announcing the call. When a call is accepted, the pop-up will show that the call is connected and the cumulative call time will be shown.

1) When an incoming call is available, press the **ENT** key or the **ANSWER** soft key to answer the call. Or, press the **CLR** key or the **HANG UP** soft key to not answer the call and hang up.



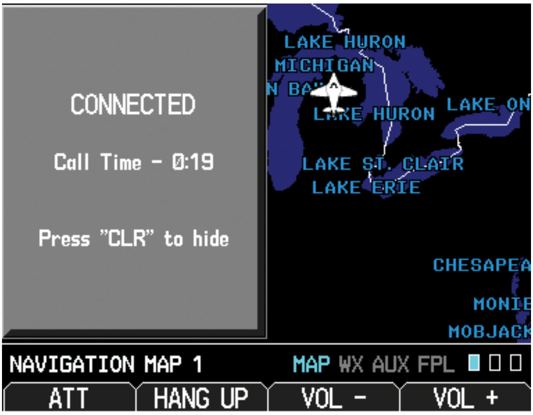
INCOMING CALL

Press "ENT" to answer
Press "CLR" to hangup

NAVIGATION MAP 1
ANSWER
HANG UP

Figure 3-88 Incoming Call Pop-Up

2) After a called is accepted and connected, the connection time will be shown on the pop-up. Press the **ATT** soft key to attenuate the call volume; pressing it again will return to normal volume. Press the **HANG UP** soft key to end the call. Press the **VOL -** or **VOL +** keys to adjust the call volume.



CONNECTED

Call Time - 0:19

Press "CLR" to hide

LAKE HURON
MICHIGAN
N BA
LAKE HURON
LAKE ON
LAKE ST. CLAIR
LAKE ERIE
CHESAPEA
MONIE
MOBJACK
NAVIGATION MAP 1
MAP WX AUX FPL
ATT
HANG UP
VOL -
VOL +

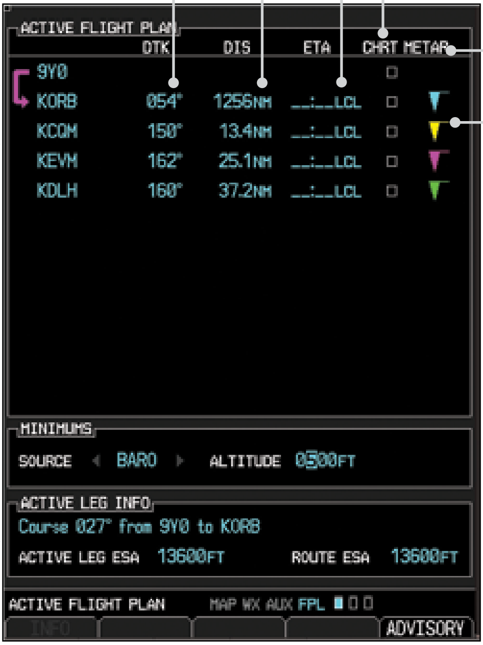
Figure 3-89 Connected Call Pop-Up

3.3 Flight Plan Pages

Use the Flight Plan page group to view details about your flight plan route. The Flight Plan Function shows the Current Flight Plan that is active in the navigation source displayed on the CDI.

3.3.1 Active Flight Plan Page

The Active Flight Plan box shows all of the legs of your flight plan with the current leg indicated in magenta. Listed are each leg with the Desired Track (DTK), Distance (DIS), and Estimated Time of Arrival (ETA) for the legs. METARs are shown for waypoints in the flight plan. In the Minimums window, the source and selected value are shown. See section 2.4.4 on Minimum Descent Altitude (MDA) or Decision Height (DH) in the PFD section and section 3.5.1.3 for more detail. In the Active Leg Info box in the lower part of the display, the Course with beginning and ending waypoints, Active Leg En Route Safe Altitude (ESA), and Route ESA are shown. METAR information is in the METAR section of the Hazard Avoidance section.



DTK, Distance, and ETA from the Previous Leg

Digital Chart Available For Waypoint

Graphic METARs

Current Leg

Flight Plan Legs

Baro Minimums Window

Active Leg Window

ACTIVE FLIGHT PLAN

	DTK	DIS	ETA	CHRT	METAR
9Y0				☐	
KORB	054°	1256NM	__:__LCL	☐	▼
KCQM	150°	13.4NM	__:__LCL	☐	▼
KEVM	162°	25.1NM	__:__LCL	☐	▼
KDLH	160°	37.2NM	__:__LCL	☐	▼

MINIMUMS

SOURCE BARO ALTITUDE 0500FT

ACTIVE LEG INFO

Course 027° from 9Y0 to KORB

ACTIVE LEG ESA 13600FT ROUTE ESA 13600FT

Figure 3-90 Flight Page 1 (Active Flight Plan)

3.3.1.1 Active Flight Plan Detail

The active flight plan is shown on the first page of the Flight Plan page group. Further information may be available for each waypoint as shown by the **INFO** or **WX** soft keys. The **WX** soft key will only appear if a data link receiver is installed and there is a Weather subscription.

1) Press the **MFD** knob and then use the large and small **MFD** knobs to highlight waypoints in the flight plan.

2) Press the **INFO** soft key, if available, to view information about the highlighted waypoint.

3) Press the **WX** soft key, if available, to view XM weather information about the highlighted waypoint.

4) Press the small **MFD** knob to return to the Active Flight Plan page.

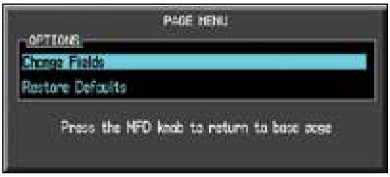
3.3.1.2 Active Flight Plan Options

The Active Flight Plan page provides information for the flight plan currently in use for navigation.

To change data fields on the Active Flight Plan Page:

1) While viewing the Active Flight Plan Page of the FPL page group, press **MENU** to display the Active Flight Plan Page Options window.

2. Turn the large **MFD** knob to highlight "Change Fields?" and then press **ENT**.



Press the MFD knob to return to base page

Figure 3-91 Active Flight Plan Page Menu Option Selection

3) Turn the large **MFD** knob to highlight the field you wish to change.

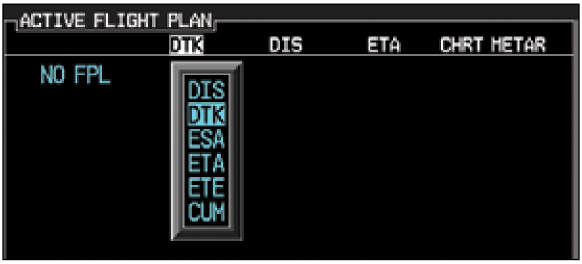


Figure 3-92 Active Flight Plan Page Menu Change Fields Option Selection

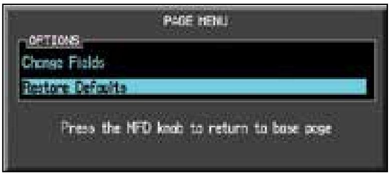
4) Turn the small **MFD** knob to select the desired data item and press **ENT**.

5) Press the small **MFD** knob to remove the cursor.

To restore factory default settings for data fields on the Active Flight Plan Page:

1) While viewing the Active Flight Plan Page of the FPL page group, press **MENU** to display the Active Flight Plan Page Options window.

2) Turn the large **MFD** knob to highlight "Restore Defaults?" and then press **ENT**.



Press the MFD knob to return to base page

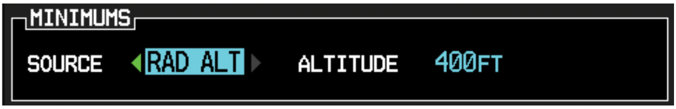
Figure 3-93 Active Flight Plan Page Menu Option Selection to Restore Defaults

3.3.1.3 Setting the Altitude Minimums Alerter

The Altitude Alerting function provides the pilot with visual and aural alerts (if interfaced to an audio panel) when approaching the Selected Altitude. See 2.4.4 Minimum Descent Altitude/Decision Height Alerting section of the PFD section for more details.

1) While viewing the Charts Page of the FPL page group, press the **Menu** key. With the Set Minimums item highlighted, press **ENT.**

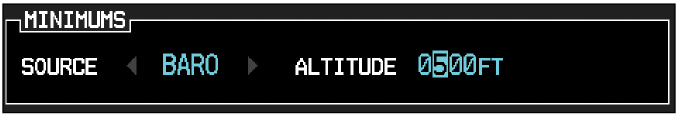
2) With the Minimums Source highlighted, select the Altitude Minimums Alerter source with small **MFD** knob.



SOURCE RAD ALT ALTITUDE 400FT

Figure 3-94 Minimums Source Selection

3) Turn the large **MFD** knob to highlight the Altitude Minimums value. Turn the large and small **MFD** knobs to change the Altitude Minimums value.



SOURCE BARO ALTITUDE 0500FT

Figure 3-95 Minimums Altitude Selection

4) Press **ENT** to activate the selected value.

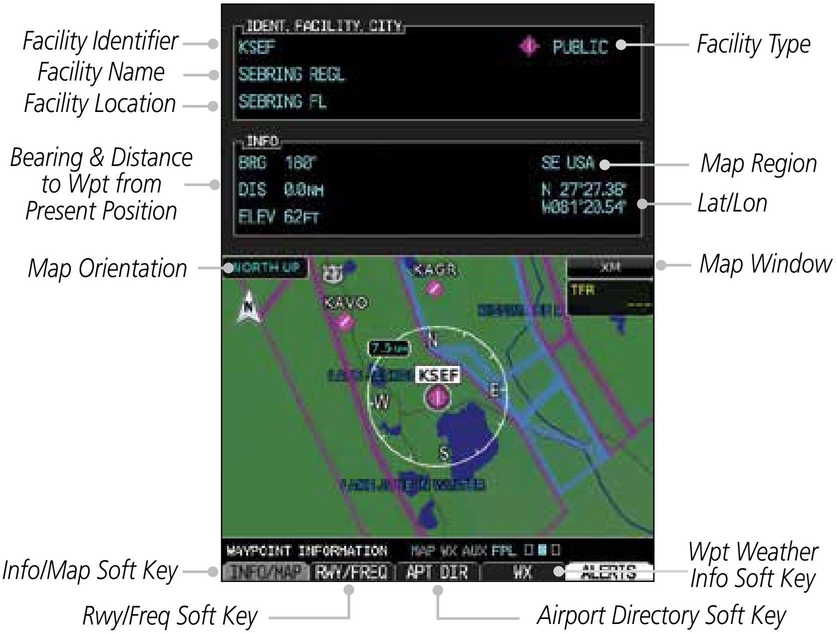
Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

In dual installations, the minimums alerting altitude value may be set from either GDU 620 and will be synchronized on both units.

***NOTE:** If you highlight the Minimums Altitude field on the FPL page and press the CLR key, it will turn the minimums functionality off.*

3.3.2 Waypoint Information Page

The Waypoint Information page provides details about a particular waypoint. You can show a waypoint by selecting it by Ident, Facility Name, or by City. The Map window shows the selected waypoint in the center of the map. The Range keys zoom in and out on the map. The Info window at the bottom of the display shows the Bearing and Distance from your present position to the selected waypoint as well as its region and Lat/Lon coordinates.



IDENT, FACILITY, CITY
KSEF PUBLIC
SEBRING REGL
SEBRING FL

INFO
BRG 180° SE USA
DIS 0.0NM N 27°27.38'
ELEV 62FT W081°20.54'

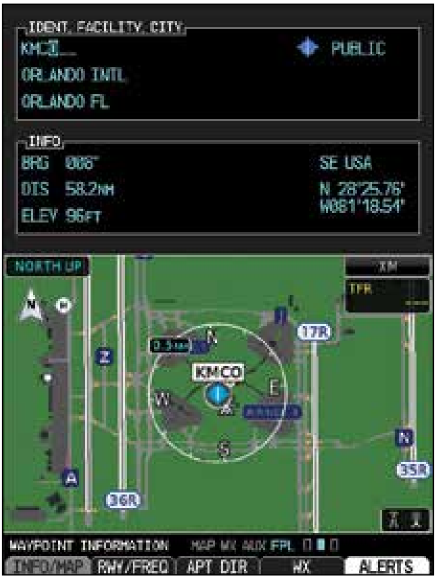
Facility Identifier
Facility Name
Facility Location
Facility Type
Bearing & Distance to Wpt from Present Position
Map Region
Lat/Lon
Map Orientation
Map Window
NORTH UP
KAGR
KAVO
7.5nm
KSEF
N
W
E
S
XM
TFR
WAYPOINT INFORMATION
MAP WX AUX FPL
INFO/MAP
RWY/FREQ
APT DIR
WX
ALERTS
Info/Map Soft Key
Wpt Weather Info Soft Key
Rwy/Freq Soft Key
Airport Directory Soft Key

Figure 3-96 Flight Plan Waypoint Info/Map Page

***NOTE:** Waypoint information is shown on the second page of the Flight Plan page group.*

3.3.2.1 Selecting a Waypoint

1) While viewing the Waypoint Information Info/Map page of the FPL page group, press the **MFD** knob and use the large and small **MFD** knobs to move the cursor to select the identifier for the waypoint.



IDENT, FACILITY, CITY
KMCO
PUBLIC
ORLANDO INTL
ORLANDO FL

INFO
BRG 088°
DIS 58.2NM
ELEV 96FT
SE USA
N 28°25.76'
W081°18.54'

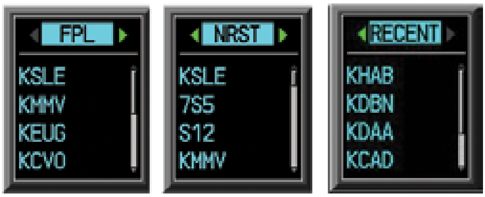
Figure 3-97 Waypoint Selection

2) Press the **ENT** key to select the waypoint.

OR

1) While viewing the Waypoint Information Info/Map page of the FPL page group, press the small **MFD** knob.

2) Turn the small **MFD** knob counterclockwise.



FPL	NRST	RECENT
KSLE	KSLE	KHAB
KMMV	7S5	KDBN
KEUG	S12	KDAA
KCVO	KMMV	KCAD

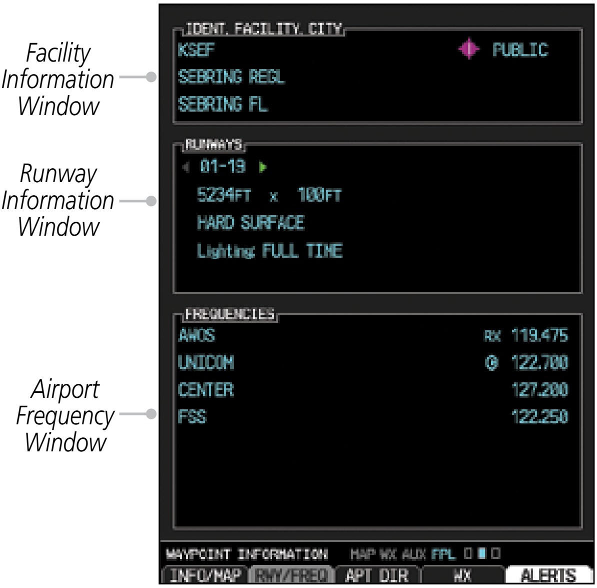
Figure 3-98 Waypoint Category Selection

3) Turn the small **MFD** knob to show FPL, NRST, or RECENT.

4) Turn the large **MFD** knob to highlight the desired airport, and then press **ENT**.

3.3.2.2 Waypoint/Runway/Frequency Information Detail

More detailed information about a selected waypoint is available by pressing the **RWY/FREQ** or **APT DIR** soft keys on the Waypoint Information page. The current destination waypoint is the default item shown. You may select a different Ident, Facility, or Location. In the Runway window, you may view information about the runways. In the Frequency window, a scroll bar is shown on the right side of the window when more frequencies are available.


Facility Information Window
Runway Information Window
Airport Frequency Window
WAYPOINT INFORMATION
MAP WX AUX FPL
INFO/MAP
RWY/FREQ
APT DIR
WX
ALERTS

IDENT, FACILITY, CITY
KSEF PUBLIC
SEBRING REGL
SEBRING FL

RUNWAYS
01-19
5234FT x 100FT
HARD SURFACE
Lighting FULL TIME

FREQUENCIES

AWOS	RX 119.475
UNICOM	122.700
CENTER	127.200
FSS	122.250

Figure 3-99 Flight Plan Waypoint Info Detail

Ident/Facility/City Selection

The current destination Identifier, Facility Type with icon, Facility Name, and City (location) are shown in the top window of the Flight Plan mode Waypoint Information page. The default is the Nearest airport if there is no active flight plan. New Identifiers may also be selected as shown in section 3.5.3.3.

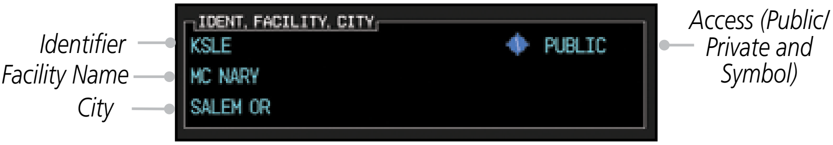

IDENT, FACILITY, CITY
KSLE PUBLIC
MC NARY
SALEM OR

Figure 3-100 Flight Plan Ident/Facility/City Detail

1) While viewing the Waypoint Information page of the FPL page group, press the **RWY/FREQ**, **APT DIR**, or **WX** soft keys to view information about the waypoint.

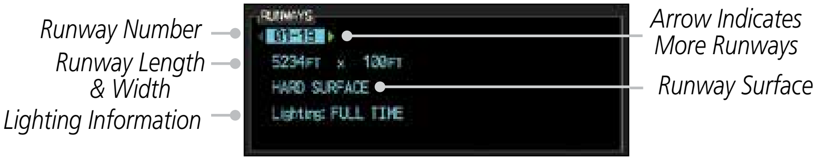
2) The current destination Ident, Facility, and City is shown, but may be changed to find information about other choices. Press the small **MFD** knob to activate the cursor. These fields may not be selected if the RWY, APT DIR, or WX pages are selected. If viewing those pages, press the soft key for that page again to return to the Waypoint Information page.

3) Use the large **MFD** knob to highlight the field you wish to change and use the small **MFD** knob to change the value.

4) Press the **ENT** key to save the selected value or press the small **MFD** knob to cancel editing.

Runway Information Selection

Information is provided for each runway showing the following detail: runway number, runway length, surface type, and the frequency for Pilot-Controlled Lighting (PCL).



RUNWAYS
01-19
5234FT x 100FT
HARD SURFACE
Lighting: FULL TIME

Figure 3-101 Waypoint Runway Information

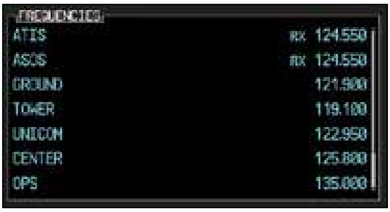
1) While viewing the Waypoint Information page of the FPL page group, press the **RWY/FREQ** soft key to view information about the waypoint and press the small **MFD** knob to activate the cursor.

2) Use the large **MFD** knob to highlight the Runway and use the small **MFD** knob to display the available runways.

3) Press the small **MFD** knob to cancel editing.

Facility Frequency Selection

The Frequency window at the bottom of the Waypoint Information page shows the frequencies available for the selected waypoint. A scroll bar is shown on the right side of the Frequency window if more frequencies are available.



FREQUENCIES

ATIS	RX 124.550
ASOS	RX 124.550
GROUND	121.900
TOWER	119.100
UNICOM	122.950
CENTER	125.800
OPS	135.000

Figure 3-102 Waypoint Frequency Information

1) While viewing the Waypoint Information page of the FPL page group, press the **RWY/FREQ** soft key to view information about the waypoint and then press the small **MFD** knob to activate the cursor.

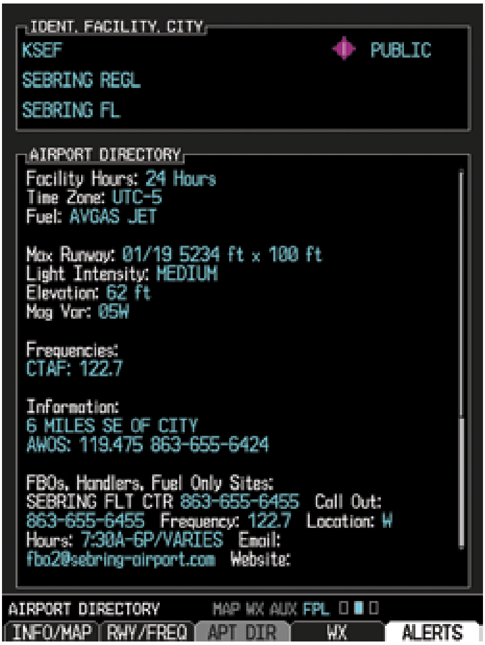
2) Turn the small **MFD** knob to scroll through the available frequencies.

3) Press the small **MFD** knob to exit.

3.3.2.3 Airport Directory

The Airport Directory lists extensive information about the selected airport and the surrounding area. The **RWY/FREQ** and **APT DIR** soft keys are greyed out and not functional unless the selected waypoint is an airport or heliport.

> ***NOTE:*** *Airport Directory information comes from a database provided by various 3rd parties. Refer to the Database information in the AUX – SYSTEM STATUS page for details on the installed Airport Directory database.*



IDENT, FACILITY, CITY
KSEF PUBLIC
SEBRING REGL
SEBRING FL

AIRPORT DIRECTORY
Facility Hours: 24 Hours
Time Zone: UTC-5
Fuel: AVGAS JET

Max Runway: 01/19 5234 ft x 100 ft
Light Intensity: MEDIUM
Elevation: 62 ft
Mag Var: 05W

Frequencies:
CTAF: 122.7

Information:
6 MILES SE OF CITY
AWOS: 119.475 863-655-6424

FBOs, Handlers, Fuel Only Sites:
SEBRING FLT CTR 863-655-6455 Call Out: 863-655-6455 Frequency: 122.7 Location: W
Hours: 7:30A-6P/VARIES Email: fbo2@sebring-airport.com Website:

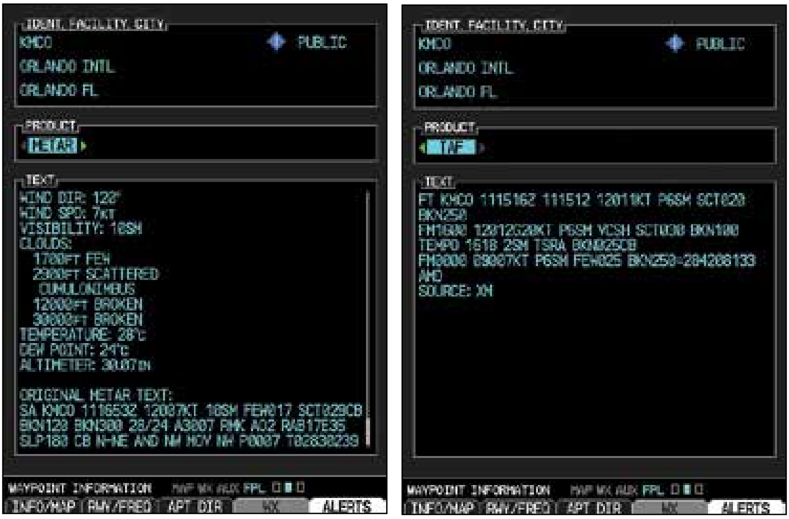
Figure 3-103 Airport Directory Information

1) While viewing the Waypoint Information page of the FPL page group, press the **APT DIR** soft key to view more information about the waypoint.
2) Press the small **MFD** knob to activate the cursor.
3) Use the small or large **MFD** knob to scroll through the information.
4) Press the small **MFD** knob to deactivate the cursor. Press the **APT DIR** soft key again to return to the Waypoint Information page.

Cover TOC

3.3.2.4 Waypoint Weather Information (Optional)

The Weather information function is available if a data link receiver is installed and weather information is available for the selected waypoint. METAR and TAF text are displayed on the Waypoint Weather Information Page. Pressing the **WX/ NOTAM** soft key will show the weather information page. Highlighting the Product selection and turning the small **MFD** knob will display METAR data, Terminal Area Forecast (TAF) information, and NOTAMs as they are available. NOTAMs are also available when FIS-B is available.


IDENT, FACILITY, CITY
KMCO
PUBLIC
ORLANDO INTL
ORLANDO FL
PRODUCT
METAR
TEXT
WAYPOINT INFORMATION
MAP WX AUX FPL
INFO/MAP
RWY/FREQ
APT DIR
WX
ALERTS
IDENT, FACILITY, CITY
KMCO
PUBLIC
ORLANDO INTL
ORLANDO FL
PRODUCT
TAF
TEXT
WAYPOINT INFORMATION
MAP WX AUX FPL
INFO/MAP
RWY/FREQ
APT DIR
WX
ALERTS

```
WIND DIR: 122°
WIND SPD: 7KT
VISIBILITY: 10SM
CLOUDS:
  1700FT FEW
  2900FT SCATTERED
   CUMULONIMBUS
  12000FT BROKEN
  30000FT BROKEN
TEMPERATURE: 28°C
DEW POINT: 24°C
ALTIMETER: 30.07IN

ORIGINAL METAR TEXT:
SA KMCO 111653Z 12007KT 10SM FEW017 SCT029CB
BKN120 BKN300 28/24 A3007 RMK AO2 RAB17E35
SLP180 CB N-NE AND NW MOV NW P0007 T02830239
```

```
FT KMCO 111516Z 111512 12011KT P6SM SCT020
BKN250
FM1600 12012G20KT P6SM VCSH SCT030 BKN100
TEMPO 1618 2SM TSRA BKN025CB
FM0000 09007KT P6SM FEW025 BKN250=284208133
AMD
SOURCE: XM
```

Figure 3-104 Waypoint Weather Information (Textual METARs and TAFs)

1) While viewing the Waypoint Information page of the FPL page group, press the **WX** soft key to view weather information for the waypoint.

2) Use the small **MFD** knob or the large **MFD** knob to scroll through the available information.

3) Press the small **MFD** knob to return to the main Flight Plan page.

3.3.3 Charts Page (Optional)

When the Chart function is available, charts will be shown on the third page of the Flight Plan page group.

See Section 5.1 for more information.

This page intentionally left blank

4 HAZARD AVOIDANCE

The G500/600 hazard avoidance features are designed to provide advisory information of potential hazards to flight safety associated with weather, terrain, and air traffic.

This section is divided into the following groups:

Terrain Avoidance

- Terrain Proximity
- TAWS-B (Optional)
- Terrain-SVT™ (Optional)

Traffic Avoidance

- Traffic Advisory System (Optional)
- Traffic Information Service (TIS) (Optional - GTX 33/330 Transponder required)
- ADS-B (Optional - GDL 88 required)

Weather

- GDL 69/69A XM® Satellite Weather (Optional)
- Weather Radar (Optional)
- GFDS Weather with the Iridium® satellite system through GSR 56 (Optional)
- FIS-B Weather with the GDL 88 (Optional)
- Stormscope® (Optional)

4.1 Terrain Details

4.1.1 Terrain Configurations

The following terrain awareness configurations and alerting are available in the G500/600 system:

- TAWS-B - A system developed to meet the terrain alerting and ground proximity requirements for Class B TAWS systems as defined in TSO-C151c. Garmin's G500/600 Terrain Awareness and Warning System (TAWS-B) is an optional feature and is intended to provide the flight crew with both aural and visual alerts to aid in preventing inadvertent Controlled Flight Into Terrain (CFIT).

- Terrain-SVT - Refers to a subset of Class B TAWS that will meet the terrain alerting requirements outlined in Section 7.b of AC 23-26. Terrain-SVT is a subset of Class B TAWS that provides a Class B TAWS FLTA functionality, including visual alerting and aural alerting. Terrain-SVT is provided with the Synthetic Vision functionality and not marketed separately.

NOTE: *Terrain-SVT is not a fully functional TAWS and does not meet the TAWS TSO-C151c.*

- Terrain-Proximity - Refers to the display of the relative terrain elevations on the moving map. No aural or visual alerts of any type are provided by a Terrain-Proximity configuration.

During power-up of the GDU 620, the terrain/obstacle database versions are displayed along with a disclaimer. At the same time, the Terrain system self-test begins. A failure message is issued if the terrain test fails (a messge will not be issued forTerrain Proximity).

Terrain Configuration	Alert Source			
	PFD Annunciator Text	SVT Terrain/ Obstacle Shading	MFD Terrain/ Obstacle Alerts	Aural Callouts
Terrain Proximity	-	-	-	-
Terrain Proximity w/ GNS/GTN TAWS	GNS/GTN TAWS	-	-	GNS/GTN TAWS
Terrain Proximity w/3rd-party TAWS	-	-	-	3rd-party TAWS
Terrain-SVT	G500/600	G500/600*	G500/600	G500/600
Terrain-SVT w/ GNS/GTN TAWS	GNS/GTN TAWS**	G500/600*/ GTN***	G500/600/ GTN***	GNS/GTN TAWS**
Terrain-SVT w/3rd-party TAWS	-			3rd-party TAWS
G500/600 TAWS-B	G500/600	G500/600*	G500/600	G500/600

Table 4-1 G500/600 Terrain Annunciations

* SVT Terrain/Obstacle shading is only available when SVT is enabled and displayed.

** If the Garmin GPS/TAWS is not available, the G500/600 Terrain-SVT will generate PFD annunciator text and aural callouts. An advisory message will indicate when reversion to Terrain-SVT alerting has occurred.

*** GTN v5.10 and later with GDU v7.00 and later.

GNS/GTN TAWS may be provided by a GNS 500WT-series or GTN-series navigator with TAWS. The GNS/GTN TAWS must be interfaced to the G500/600 as GPS 1.

Each of the terrain awareness configurations are detailed in the following sub-sections.

4.1.2 Terrain Scale

The Terrain Scale option in the Map page group selects whether the Terrain Scale is shown on the Navigation Map. The Terrain scale is located on the right side of the display.

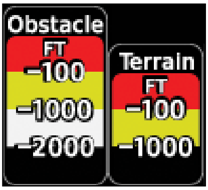


Figure 4-1 Terrain Scale

Color	Description
Red	Terrain is less than 100 ft below the aircraft, or above the aircraft, altitude.
Yellow	Terrain is between 100 ft and 1000 ft below the aircraft altitude.
Black	Terrain is more than 1000 feet below the aircraft.

Table 4-2 Terrain Scale Color Codes

4.2 Terrain Altitude

4.2.1 Computing GPS Altitude for TAWS

TAWS uses information provided from the GPS receiver to provide a horizontal position and altitude. GPS altitude is derived from satellite measurements. GPS altitude is converted to a Mean Sea Level (MSL)-based altitude (GPS-MSL altitude) and is used to determine TAWS alerts. GPS-MSL altitude accuracy is affected by factors such as satellite geometry, but it is not subject to variations in pressure and temperature that normally affect pressure altitude devices. GPS-MSL altitude does not require local altimeter settings to determine MSL altitude. Therefore, GPS altitude provides a highly accurate and reliable MSL altitude source to calculate terrain and obstacle alerts.

The terrain and obstacle databases used by TAWS are referenced to Mean Sea Level. Using the GPS position and GPS-MSL altitude, TAWS displays a 2-D (or 3-D with SVT) picture of the surrounding terrain and obstacles relative to the position and altitude of the aircraft. Furthermore, the GPS position and GPS-MSL altitude are used to calculate and “predict” the aircraft’s flight path in relation to the surrounding terrain and obstacles. In this manner, TAWS can provide advanced alerts of predicted dangerous terrain conditions.

4.2.2 Baro-Corrected Altitude Versus GPS-MSL Altitude

Baro-corrected altitude (or indicated altitude) is derived by adjusting the altimeter setting for local atmospheric conditions. The most accurate baro-corrected altitude can be achieved by frequently updating the altimeter setting to the nearest reporting station along the flight path. However, because actual atmospheric conditions seldom match the standard conditions defined by the International Standard Atmosphere (ISA) model (where pressure, temperature, and lapse rates have fixed values), it is common for the baro-corrected altitude (as read from the altimeter) to differ from the GPS-MSL altitude. This variation results in the aircraft’s true altitude differing from the baro-corrected altitude.

4.3 Terrain Proximity

Garmin Terrain is a non-TSO-C151c terrain awareness system provided as a standard feature of GDU 620 to increase situational awareness and help reduce controlled flight into terrain (CFIT). Terrain may be displayed on the Map page group Navigation Map and Terrain pages.

Terrain requires the following to operate properly:

- The system must have a valid 3-D GPS position solution.
- The system must have a valid terrain/obstacle.

4.3.1 Displaying Terrain Proximity

The Terrain Proximity page is in the Map page group. Terrain is also selectable on the Navigation Map pages.

4.3.1.1 Terrain Proximity Page Display on the Terrain Page

1) Turn the large **MFD** knob to the MAP page group.

2) Turn the small **MFD** knob to the Terrain page.

3) Press the **VIEW** soft key to show the **360** and **ARC** soft keys.

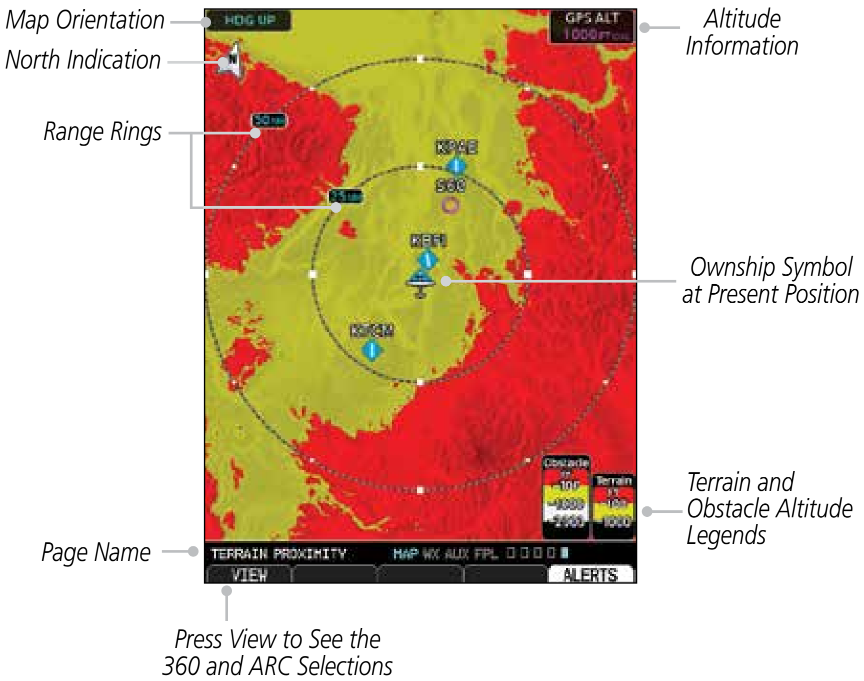
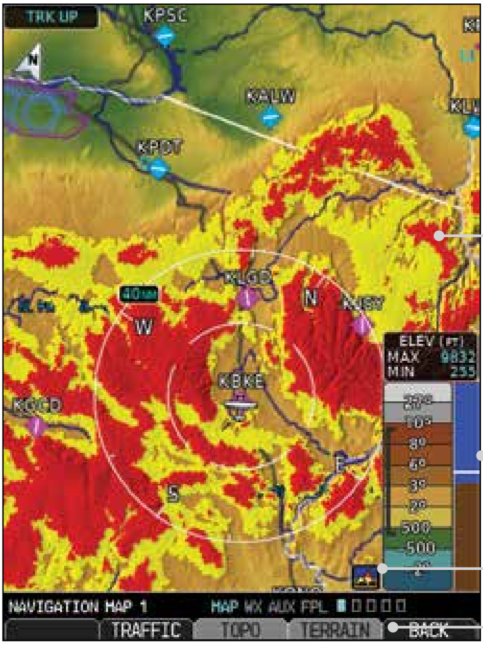

Map Orientation
North Indication
Range Rings
Page Name
Press View to See the 360 and ARC Selections
Altitude Information
Ownship Symbol at Present Position
Terrain and Obstacle Altitude Legends
HDG UP
GPS ALT 1000FT
KPAE
SEA
KBFI
KRNT
Obstacle
Terrain
TERRAIN PROXIMITY
MAP WX AUX FPL
VIEW
ALERTS

Figure 4-2 Terrain Page with Aviation Data Displayed and 360° View


TRK UP
KPSC
KALW
KPDT
KLGD
N
40NM
W
KBKE
KGCD
S
E
ELEV (FT)
MAX 9832
MIN 255
NAVIGATION MAP 1
MAP WX AUX FPL
TRAFFIC
TOPO
TERRAIN
BACK

Terrain Overlay

Terrain Scale

Terrain Data Icon

MAP Overlay Soft Keys

Figure 4-3 Terrain on Navigation Map Page

4.3.1.2 Terrain Proximity Page Display on a Navigation Map Page

1) Turn the large **MFD** knob to the MAP page group.

2) On Navigation Map page 1 or 2, press the **MAP** soft key to show the **TERRAIN** soft key.

3) Press the **TERRAIN** soft key to overlay terrain on the Navigation Map.

***NOTE:** Terrain Proximity and NEXRAD are mutually exclusive on the map page.*

4.3.1.3 Terrain Proximity Page 120° Arc or 360° Rings

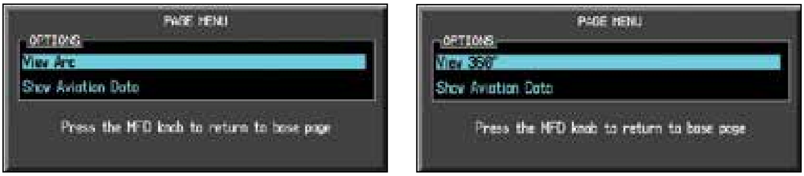
Select the 120º Arc or 360º rings overlay for the Terrain page with either the 360/Arc soft keys or from the Page Menu.

1) Press the **VIEW** soft key to show the 360 and ARC soft keys.

2) Press the **360** or **Arc** soft key.

OR

Press **MENU** and with the View Arc or View 360° selection highlighted press **ENT**.



PAGE MENU
OPTIONS
View Arc
Show Aviation Data
Press the MFD knob to return to base page

PAGE MENU
OPTIONS
View 360°
Show Aviation Data
Press the MFD knob to return to base page

Figure 4-4 Terrain Page Menu Viewing Selections

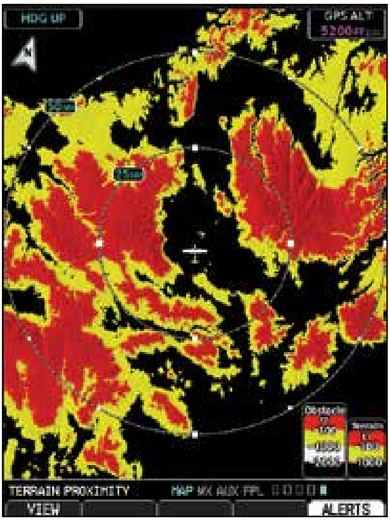

HDG UP
GPS ALT
5200FT
50nm
25nm
Obstacle
Terrain
TERRAIN PROXIMITY
MAP WX AUX FPL
VIEW
ALERTS

Figure 4-5 Terrain Page with 360° Rings

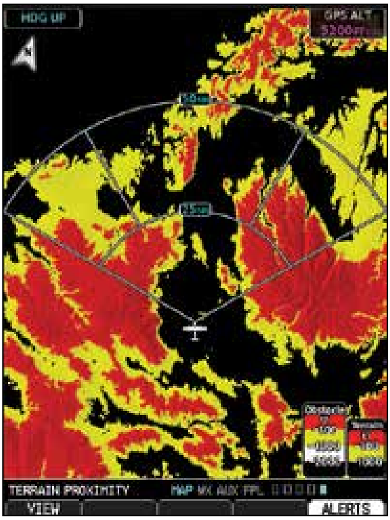
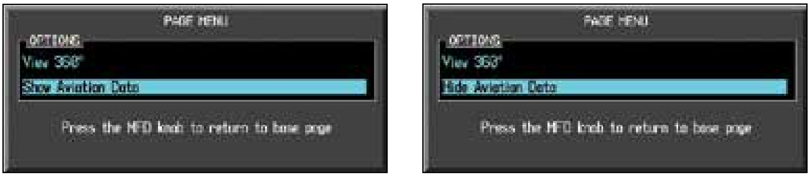

HDG UP
GPS ALT
5200FT
50nm
25nm
Obstacle
Terrain
TERRAIN PROXIMITY
MAP WX AUX FPL
VIEW
ALERTS

Figure 4-6 Terrain Page with 120° Arc

4.3.1.4 Terrain Proximity Page Aviation Data

The Page Menu selections allow you to hide or show aviation data overlay on the Terrain page.

1) While viewing the Terrain page of the MAP page group, press **MENU** for Map selections to hide or show aviation data overlay on the Terrain page.



PAGE MENU
OPTIONS
View 360°
Show Aviation Data
Press the MFD knob to return to base page

PAGE MENU
OPTIONS
View 360°
Hide Aviation Data
Press the MFD knob to return to base page

Figure 4-7 Show/Hide Aviation Data on the Terrain Page

2) Press **ENT** to save the highlighted value.

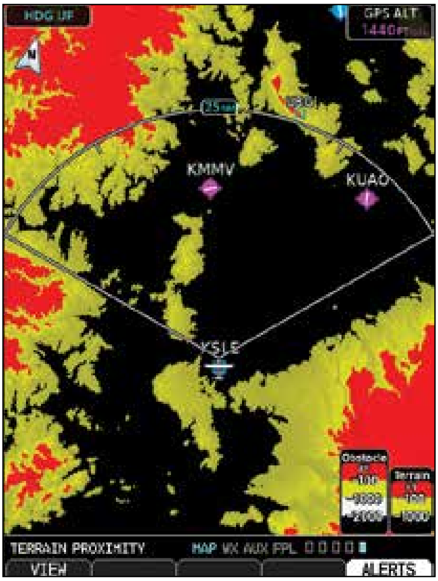

HDG UP
GPS ALT
1440FT
25NM
KMMV
KUAO
KSLE
Obstacle
Terrain
2000
1000
TERRAIN PROXIMITY
MAP WX AUX FPL
VIEW
ALERTS

Figure 4-8 Terrain Page with Aviation Data Displayed and 120° Arc View

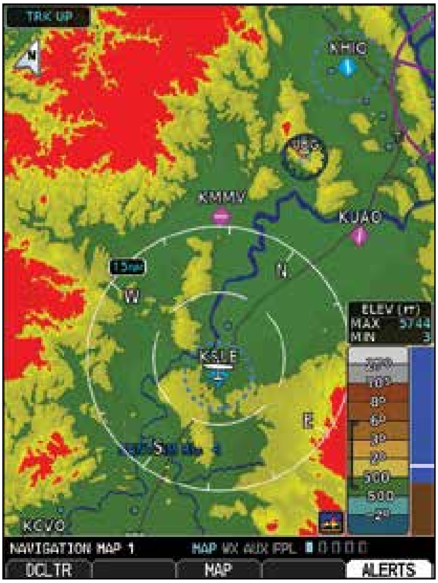

TRK UP
KHIO
KMMV
KUAO
15NM
N
W
E
S
KSLE
ELEV (FT)
MAX 5744
MIN 3
KCVO
NAVIGATION MAP 1
MAP WX AUX FPL
DCLTR
MAP
ALERTS

Figure 4-9 Navigation Map Page with Terrain Data Displayed

4.3.2 Terrain Proximity Limitations

Terrain Proximity displays terrain and obstructions relative to the altitude of the aircraft. The displayed terrain is advisory in nature only. Individual obstructions may be shown if available in the database. However, all obstructions may not be available in the database and data may be inaccurate. Never use this information for navigation or to maneuver to avoid obstacles.

Terrain information is based on terrain elevation information in a database that may contain inaccuracies. Terrain information should be used as an aid to situational awareness. Never use it for navigation or to maneuver to avoid terrain.

Terrain uses terrain and obstacle information supplied by government sources. The displayed information should never be understood as being all-inclusive.

***WARNING:** The data contained in the TERRAIN databases comes from government agencies. Garmin accurately processes and cross-validates the data but cannot guarantee the accuracy and completeness of the data.*

4.3.3 System Status

The Terrain system continually monitors several system-critical items, such as database validity, hardware status, and GPS status. Should the system detect a failure, a failure message will be displayed.

4.4 Terrain Awareness and Warning System (TAWS-B) Optional

TAWS (Terrain Awareness and Warning System) is an optional feature to increase situational awareness and aid in reducing controlled flight into terrain (CFIT). TAWS provides visual and aural annunciations when terrain and obstacles are within the given altitude threshold from the aircraft.

TAWS satisfies TSO-C151c Class B requirements for certification. Class B TAWS is required for all Part 91 turbine aircraft operations with six or more passenger seats and for Part 135 turbine aircraft operations with six to nine passenger seats (FAR Parts 91.223, 135.154).

4.4.1 TAWS-B Requirements

TAWS requires the following to operate properly:

- A valid terrain/obstacle
- A valid 3-D GPS position solution

4.4.2 TAWS-B Limitations

⚠ ***WARNING:** The data contained in the TAWS databases comes from government agencies. Garmin accurately processes and cross-validates the data but cannot guarantee the accuracy and completeness of the data.*

TAWS displays terrain and obstructions relative to the altitude of the aircraft. Refer to AFM for procedures for TAWS alerts.

TAWS uses terrain and obstacle information supplied by government sources. Terrain information is based on terrain elevation information in a database that may contain inaccuracies. Individual obstructions may be shown if available in the database. The data undergoes verification by Garmin to confirm accuracy of the content, per TSO-C151c.

4.4.3 Using TAWS

During G500/600 power-up, the terrain/obstacle database versions are displayed along with a disclaimer to the pilot. At the same time, TAWS self-test begins. One of the following aural messages is generated:

- *"TAWS System Test OK"*
- *"TAWS System Failure"*

TAWS information can be displayed on the MFD in the TAWS page of the MAP page group. Terrain and obstacles with heights greater than 200 feet Above Ground Level (AGL) are contained in the database.

4.4.4 Displaying TAWS Data

TAWS uses yellow and red to depict terrain and obstacles alerts relative to aircraft altitude. Colors are adjusted automatically as the aircraft altitude changes. The colors and symbols shown below are used to represent terrain, obstacles, and potential impact points.

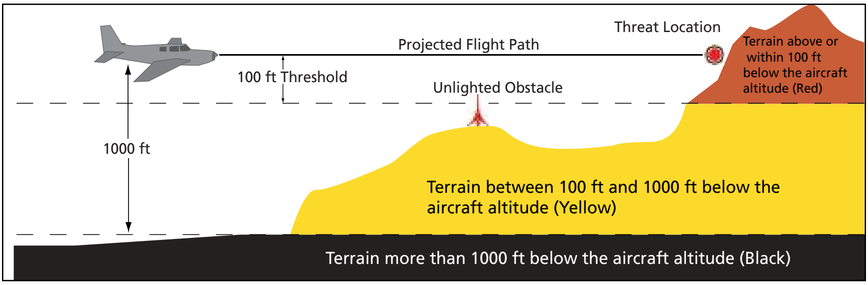

Threat Location
Projected Flight Path
Terrain above or within 100 ft below the aircraft altitude (Red)
100 ft Threshold
Unlighted Obstacle
1000 ft
Terrain between 100 ft and 1000 ft below the aircraft altitude (Yellow)
Terrain more than 1000 ft below the aircraft altitude (Black)

Figure 4-10 Terrain Altitude/Color Correlation for Terrain Proximity

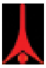
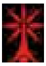
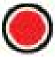
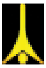
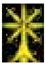
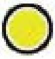
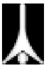
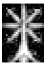
	Unlighted Obstacle		Lighted Obstacle		Threat Location Indicator	Terrain Color	Terrain/Obstacle Location
	< 1000 ft AGL	> 1000 ft AGL	< 1000 ft AGL	> 1000 ft AGL			
Obstacle Symbol						Red	Terrain/Obstacle at or within 100 ft below current aircraft altitude
						Yellow	Terrain/Obstacle between 100 ft and 1000 ft below current aircraft altitude
						White	Terrain/Obstacle between 1000 ft and 2000 ft below current aircraft altitude

Table 4-3 TAWS Terrain/Obstacle Colors and Symbology

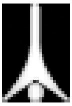
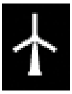
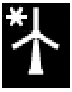
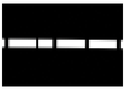
Tower	Windmill	Windmill in Group	Power Line
			

Table 4-4 Obstacle Icon Types

4.4.4.1 TAWS Page

TAWS information is displayed on the last page of the Map page group. The TAWS Page is specialized to show terrain, obstacle, and Threat Area Indication data in relation to the aircraft's current altitude, without clutter from the basemap. Aviation data (airports, VORs, and other NAVAIDs) can be displayed for reference. The display automatically zooms in to the closest potential point of impact on the TAWS Page.

Aircraft orientation on this map is always heading up unless there is no valid heading. If orientation is not heading up, it will be track up. Two views are available relative to the position of the aircraft: the 360° default display and the radar-like ARC (120°) display. Map range is adjustable with the **RNG** keys from 1 to 200 NM, as indicated by the map range rings (or arcs).

Displaying TAWS Information

1) In MAP page group, turn the small **MFD** knob to reach the TAWS Page.

2) Press the **RNG** keys to display a larger or smaller area.

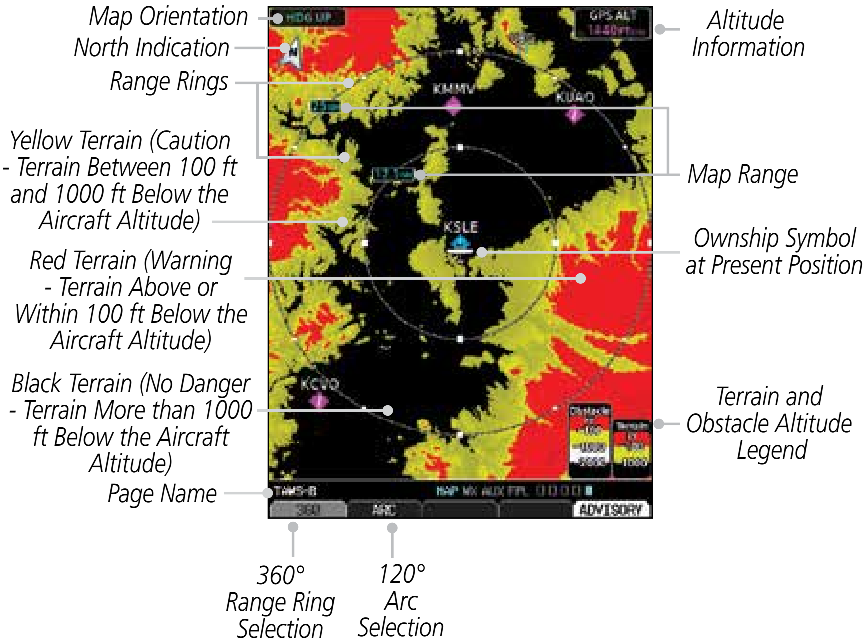

Map Orientation
North Indication
Range Rings
Yellow Terrain (Caution - Terrain Between 100 ft and 1000 ft Below the Aircraft Altitude)
Red Terrain (Warning - Terrain Above or Within 100 ft Below the Aircraft Altitude)
Black Terrain (No Danger - Terrain More than 1000 ft Below the Aircraft Altitude)
Page Name
Altitude Information
Map Range
Ownship Symbol at Present Position
Terrain and Obstacle Altitude Legend
360° Range Ring Selection
120° Arc Selection
HDG UP
GPS ALT
KMMV
KUAO
KSLE
KCVO
TAWS-B
360
ARC
ADVISORY

Figure 4-11 360˚ View on the TAWS Page

Changing the TAWS Page View Between 360 and Arc

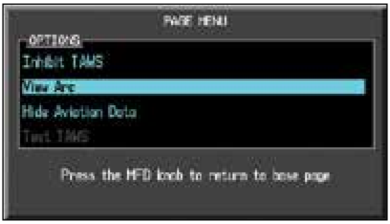
1) In MAP page group, turn the small **MFD** knob to reach the TAWS page.

2) Press **VIEW** and then the **360** or **ARC** soft key to select the desired view.

OR

1) While viewing the TAWS page, press the **MENU** key.

2) Turn the large or small **MFD** knob to highlight "View Arc" or "View 360°" and then press **ENT**.


PAGE MENU
OPTIONS
Inhibit TAWS
View Arc
Hide Aviation Data
Test TAWS

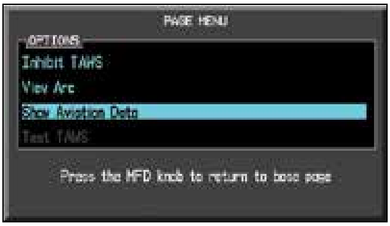
Press the MFD knob to return to base page

Figure 4-12 Select TAWS Display View (360 or Arc)

Showing/Hiding Aviation Information on the TAWS Page

1) In MAP page group, turn the small **MFD** knob to reach the TAWS page.

2) Press the **MENU** key. Turn the large or small **MFD** knob to highlight "Show Aviation Data" or "Hide Aviation Data" and then press **ENT**.


PAGE MENU
OPTIONS
Inhibit TAWS
View Arc
Show Aviation Data
Test TAWS

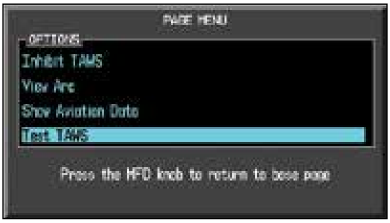
Press the MFD knob to return to base page

Figure 4-13 Show/Hide Aviation Data

Manually Testing the TAWS System

1) Select the TAWS page.

2) Press the **MENU** key and then turn the large or small **MFD** knob to highlight "Test TAWS."


PAGE MENU
OPTIONS
Inhibit TAWS
View Arc
Show Aviation Data
Test TAWS

Press the MFD knob to return to base page

Figure 4-14 TAWS Page Menu

3) Press the **ENT** key to confirm the selection.

One of the following aural messages is generated:

- "TAWS System Test OK"
- "TAWS System Failure"

TAWS TEST is annunciated in yellow on the TAWS page and in white on the PFD.

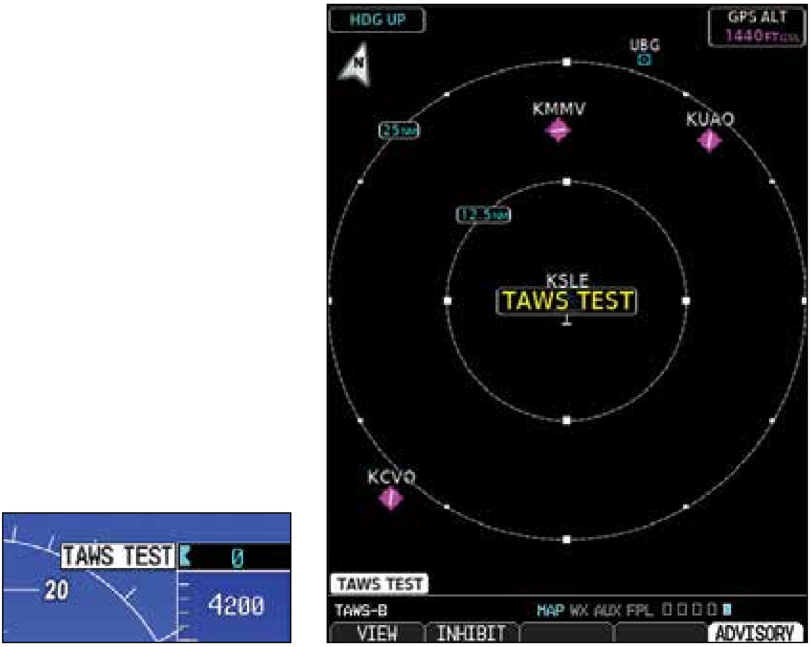
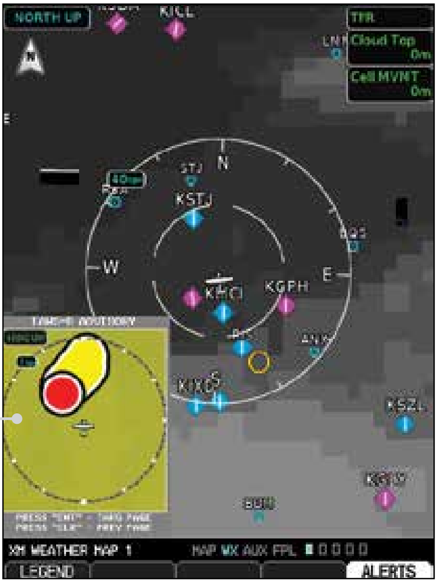

TAWS TEST
20
0
4200
HDG UP
GPS ALT
1440FT
N
UBG
KMMV
KUAO
25NM
12.5NM
KSLE
TAWS TEST
KCVO
TAWS TEST
TAWS-B
MAP WX AUX FPL
VIEW
INHIBIT
ADVISORY

Figure 4-15 TAWS Test Display and PFD Annunciation

4.4.5 TAWS Alerts

Alerts are issued when flight conditions meet parameters that are set within TAWS software algorithms. When an alert is issued, visual annunciations are displayed and aural alerts are simultaneously issued. TAWS alert types are shown in the TAWS Alerts Summary (Table 4-4) with corresponding annunciations and aural messages.

When an alert is issued, annunciations appear on the PFD and MFD (TAWS map page only). The TAWS Alert Annunciation is shown to the upper left of the Altimeter on the PFD and below the Terrain Legend on the MFD. If the TAWS page is not displayed at the time, a pop-up alert appears on the MFD on the page being viewed.



TAWS Alert Pop-Up

Figure 4-16 TAWS Alert Pop Up

To acknowledge the pop-up alert:

- Press the **CLR** key (returns to the currently viewed page)

  OR
- Press the **ENT** key (accesses the TAWS Page)

If the pilot takes no action, the pop-up will be removed when the alert is no longer active.

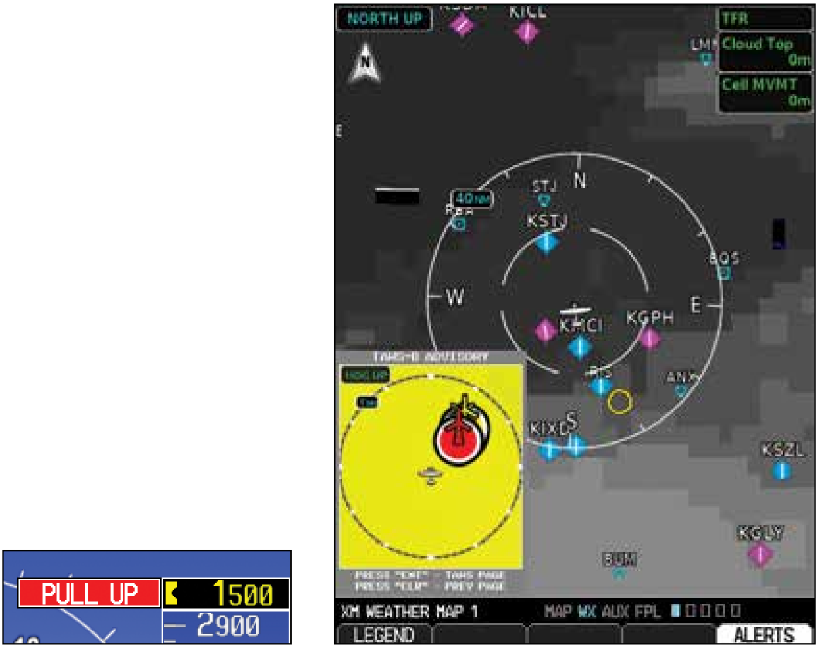

PULL UP
1500
2900
NORTH UP
KILL
TFR
Cloud Top
0m
Cell MVMT
0m
N
W
E
S
STJ
KSTJ
40NM
KMCI
KGPH
BOS
ANX
KIXD
KSZL
KOLY
BUM
TAWS-B ADVISORY
PRESS "ENT" TAWS PAGE
PRESS "CLR" PREV PAGE
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ALERTS

Figure 4-17 TAWS Alert Annunciations (Pull Up)

4.4.5.1 TAWS-B Alerting Colors and Symbology

Color and symbols are also associated with TAWS alerts. The three TAWS alert levels and their associated text coloring as well as any associated symbology are shown in the following table.

Alert Level	Annunciator Text	Threat Area Indication Symbol	Example Visual Annunciation
Warning	White text on red background	🔴	PULL UP
Caution	Black text on yellow background	🟡	TERRAIN

Table 4-4 TAWS Alert Colors and Symbology

Alert Type	PFD/MFD Alert Annunciation	Aural Message
Excessive Descent Rate Warning (EDR-W)	PULL UP	"Pull Up"
FLTA Terrain Warning (RTC-W, ITI-W)	PULL UP	"Terrain Ahead, Pull Up; Terrain Ahead, Pull Up"* or "Terrain, Terrain; Pull Up, Pull Up"
FLTA Obstacle Warning (ROC-W, IOI-W)	PULL UP	"Obstacle Ahead, Pull Up; Obstacle Ahead, Pull Up"* or "Obstacle, Obstacle; Pull Up, Pull Up"
FLTA Wire Warning (ILI-W, RLC-W)	PULL UP	"Wire Ahead, Pull Up; Wire Ahead, Pull Up"* or "Wire, Wire, Pull Up, Pull Up"
FLTA Terrain Caution (RTC-C, ITI-C)	TERRAIN	"Terrain Ahead; Terrain Ahead"* or "Caution, Terrain; Caution, Terrain"
FLTA Obstacle Caution (ROC-C, IOI-C)	OBSTACLE	"Obstacle Ahead; Obstacle Ahead"* or "Caution, Obstacle; Caution, Obstacle"
FLTA Wire Caution (ILI-C, RLC-C)	WIRE	"Wire Ahead"
Premature Descent Alert Caution (PDA)	TERRAIN	"Too Low, Terrain"
Voice Callout (VCO-500)	None	"Five-Hundred"
Excessive Descent Rate Caution (EDR-C)	TERRAIN	"Sink Rate"
Negative Climb Rate Caution (NCR-C)	TERRAIN	"Don't Sink"* or "Too Low, Terrain"

* *Alerts with multiple messages are configurable at installation and are installation-dependent. Alerts for the default configuration are indicated with asterisks.*

Table 4-5 TAWS-B Alerts Summary

4.4.5.2 Excessive Descent Rate Alert

The purpose of the **Excessive Descent Rate (EDR)** alert is to provide notification when the aircraft is determined to be descending upon terrain at an excessive rate. The parameters for the alert as defined by TSO-C151c are shown below.

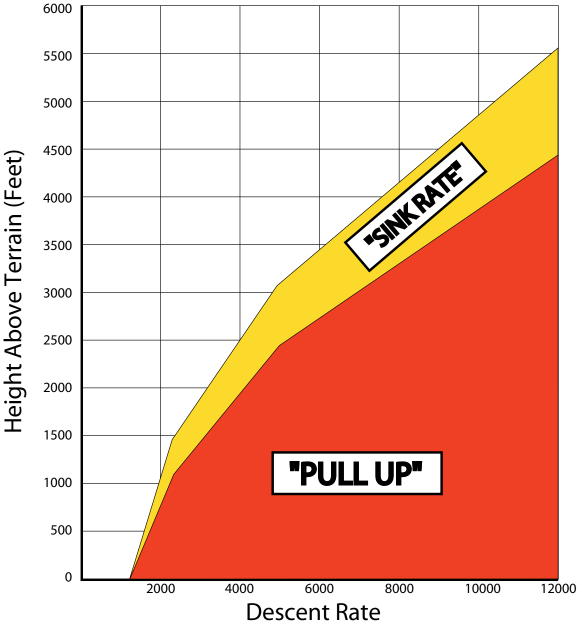


Figure 4-18 Excessive Descent Rate Alert Criteria

4.4.5.3 Forward Looking Terrain Avoidance

Reduced Required Terrain Clearance (RTC) and **Reduced Required Obstacle Clearance (ROC)** alerts are issued when the aircraft flight path is above terrain, yet is projected to come within the minimum clearance values in the FLTA Alert Minimum Terrain and Obstacle Clearance Values table. When an RTC alert and/or a ROC is issued, a potential impact point is displayed on the TAWS Page.

Imminent Terrain Impact (ITI) and **Imminent Obstacle Impact (IOI)** alerts are issued when the aircraft is below the elevation of a terrain or obstacle cell in the aircraft's projected path. ITI and IOI alerts are accompanied by a potential impact point displayed on the TAWS Page. The alert is annunciated when the projected vertical flight path is calculated to come within minimum clearance altitudes in the following table.

Flight Phase	Minimum Clearance Altitude (feet)	
	Level Flight	Descending
En Route	700	500
Terminal	350	300
Approach	150	100
Departure	100	100

Table 4-6 FLTA Alert Minimum Terrain and Obstacle Clearance Values

During final approach, FLTA alerts are automatically inhibited when the aircraft is below 200 feet AGL while within 0.5 NM of the approach runway or below 125 feet AGL while within 1.0 NM of the runway threshold.

4.4.5.4 Premature Descent Alerting

A Premature Descent Alert (PDA) is issued when the system detects that the aircraft is significantly below the normal approach path to a runway.

PDA alerting begins when the aircraft is within 15 NM of the destination airport and ends when the aircraft is either 0.5 NM from the runway threshold or is at an altitude of 125 feet AGL while within 1.0 NM of the threshold. During the final descent, algorithms set a threshold for alerting based on speed, distance, and other parameters.

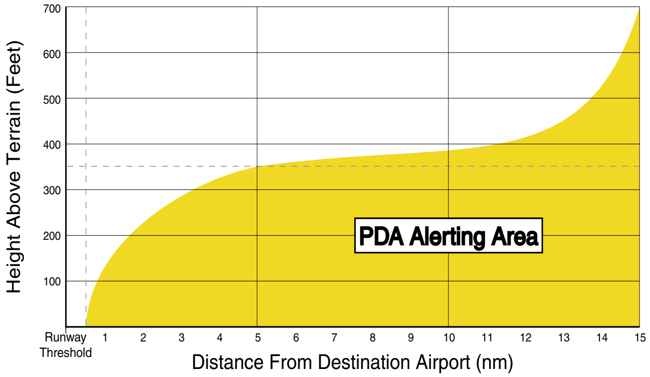


Figure 4-19 PDA Alerting Threshold

PDA and FLTA aural and visual alerts can be manually inhibited. Discretion should be used when inhibiting TAWS and the system should be enabled when appropriate. When TAWS is inhibited, the alert annunciation "TAWS INHB" is shown on the PFD and MFD (Figure 4-16).

4.4.5.5 Inhibiting/Enabling TAWS Alerting

TAWS also has an inhibit mode that deactivates the PDA/FLTA aural and visual alerts. Pilots should use discretion when inhibiting TAWS and always remember to enable the system when appropriate. Only the PDA and FLTA alerts are disabled in the inhibit mode.

NOTE:* *See AFMS for guidance on inhibiting TAWS.

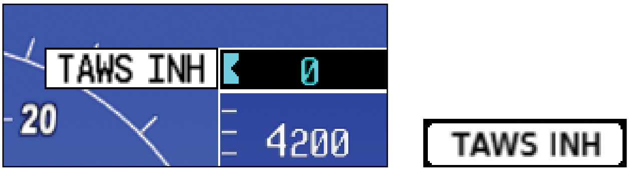


Figure 4-20 TAWS Alerting Disabled (TAWS Inhibited) Annunciation (PFD & MFD)

1) In MAP page group, turn the small **MFD** knob to reach the TAWS Page.

2) Press the **INHIBIT** soft key to inhibit or enable TAWS (choice dependent on current state).

OR

1) Press the **MENU** key.

2) Use the large or small **MFD** knob to highlight "Inhibit TAWS" or "Enable TAWS" (choice dependent on current state) and press the **ENT** key.

4.4.5.6 Five-Hundred Aural Alert

The purpose of the aural alert message ***"Five-hundred"*** is to provide an advisory alert that the aircraft is 500 feet above terrain. When the aircraft descends within 500 feet of terrain, the aural message "Five-hundred" is generated. There are no display annunciations or pop-up alerts that accompany the aural message.

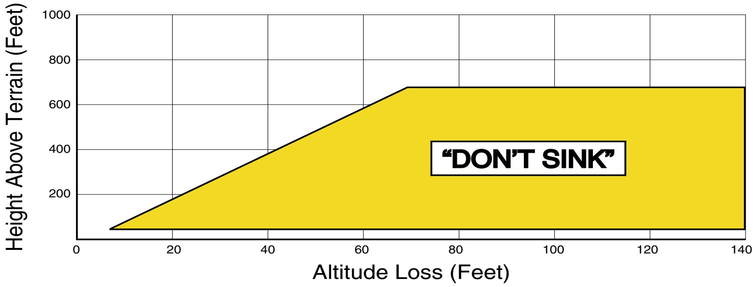
NOTE:* *The five-hundred aural callout provided by TAWS-B is not in relation to the optional radar altimeter, if installed.

4.4.5.7 Negative Climb Rate After Take-Off Alert (NCR)

The **Negative Climb Rate (NCR) After Take-Off** alert (also referred to as "Altitude Loss After Take-Off") provides alerts when the system determines the aircraft is losing altitude (closing upon terrain) after takeoff. The aural message "Don't Sink" is given for NCR alerts, accompanied by an annunciation and a pop-up terrain alert on the display. NCR alerting is only active when departing from an airport and when the following conditions are met:

- Height above the terrain is less than 700 feet
- Distance from the departure airport is 2 NM or less
- Heading change from the departure heading is less than 110°

The NCR alerting parameters as defined by TSO-C151c are shown below.



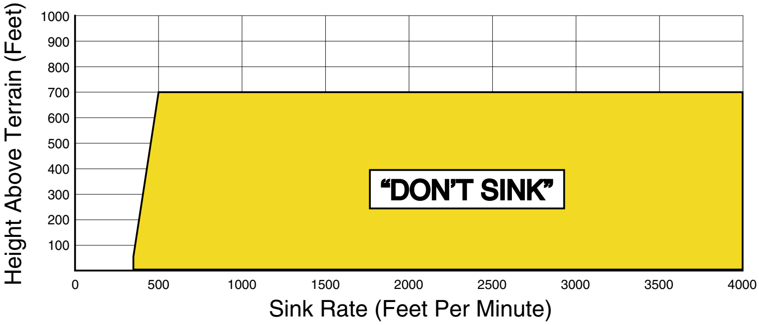


Figure 4-21 Negative Climb Rate (NCR) Alert Criteria

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.4.5.8 TAWS Not Available Alert

TAWS requires a 3-D GPS position solution along with specific vertical accuracy minimums. Should the position solution become degraded or if the aircraft is out of the database coverage area, the annunciation "TAWS N/A" is generated in the annunciation window and on the TAWS page. The aural message "TAWS Not Available" is generated. When the GPS signal is re-established and the aircraft is within the database coverage area, the aural message "TAWS Available" is generated.

4.4.5.9 TAWS Failure Alert

TAWS continually monitors several system-critical items such as database validity, hardware status, and GPS status. If the terrain/obstacle database is not available, the aural message "TAWS System Failure" is generated along with a 'TAWS FAIL' annunciation.

4.4.6 TAWS System Status

During power-up, TAWS conducts a self-test of its aural and visual annunciations. The system test can also be manually initiated. An aural alert is issued at test completion. TAWS System Testing is disabled when ground speed exceeds 30 knots.

Alert Type	PFD/MFD Alert Annunciation	Aural Message
TAWS Available	None	"TAWS Available"
TAWS System Test in Progress	TAWS TEST	None
TAWS System Test Pass	None	"TAWS System Test OK"
TAWS N/A	TAWS N/A	TAWS Not Available
TAWS Alerting is Disabled	TAWS INH	None
TAWS System Test Fail	TAWS FAIL	"TAWS System Failure"

Table 4-7 TAWS-B System Test Status Annunciations

4.5 External TAWS

If a GNS 500WT-series or GTN-series with TAWS unit is interfaced as GPS 1, text alerts generated by the external TAWS unit will be displayed on the PFD. Refer to the GNS 500WT-series or GTN-series Pilot's Guides and/or Addendums for more information regarding these TAWS alerts. Text alerts received from the GNS/GTN TAWS unit will be displayed to the left and aligned with the top of the Altitude Tape on the PFD. A new annunciation will flash for approximately five seconds.

- TAWS annunciations can only be received from the #1 GPS unit.
- If the Garmin GPS/TAWS is not available and Terrain-SVT is enabled, the G500/600 Terrain-SVT will generate PFD text alerts and aural callouts. An advisory message will indicate when reversion to Terrain-SVT alerting has occurred.
- For External TAWS (HSDB), terrain impact points on the MFD are generated from the data crossfilled from the GTN.

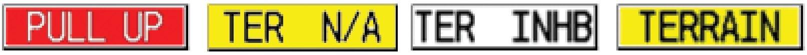


Figure 4-22 TAWS Annunciations from a GNS/GTN TAWS

Terrain Configurations	PFD/MFD Visual Annunciations	MFD Pop-up Alert	Aural Alerting
GTN w/ External TAWS Unit Installed (HSDB)	When configured for External TAWS (HSDB), the GDU will not generate any alerts; all alerts are crossfilled from the GTN.	None	None
G500/600 Terrain Proximity w/ External TAWS Unit Installed (500W-series)	PFD annunciations are generated from the External TAWS Unit. No MFD Annunciations.	None	None

Terrain Configurations	PFD/MFD Visual Annunciations	MFD Pop-up Alert	Aural Alerting
G500/600 w/ Terrain-SVT and External TAWS Unit Installed (500W-series)	PFD annunciations are generated from the External TAWS Unit. No MFD Annunciations are generated from the G500/600. Terrain impact shading on the PFD SVT is generated through the internal Terrain-SVT alerting.	None	G500/600 aural alerts are suppressed.
G500/600 w/ TAWS-B	Annunciations generated from the G500/600.	Generated from the G500/600.	Not suppressed.

Table 4-8 G500/600 TAWS Annunciations

4.6 Terrain-SVT™

Garmin Terrain-SVT™ refers to a subset of Class B TAWS that meets the terrain alerting requirements outlined in Section 7.b of AC 23-26. Terrain-SVT is a subset of Class B TAWS that provides a Class B TAWS FLTA functionality with visual alerting and aural alerting. Terrain-SVT is provided with Synthetic Vision Technology (SVT™) functionality and not marketed separately.

Garmin Terrain-SVT alerting consists of the following alert types:

- Forward Looking Terrain Avoidance (FLTA) Alerting which consists of:
- Required Terrain Clearance (RTC) / Required Obstacle Clearance (ROC) Alerting
- Imminent Terrain Impact (ITI) / Imminent Obstacle Impact (IOI) Alerting

Garmin Terrain-SVT is available in G500/600 GDU 620 SW version 3.00, and later.

Garmin Terrain-SVT is required for those SVT installations that do not have TAWS-A or TAWS-B enabled.

4.6.1 Terrain-SVT Page 120° Arc or 360° Rings

Select the 120º Arc or 360º rings overlay for the Terrain page with either the 360/Arc soft keys or from the Page Menu.

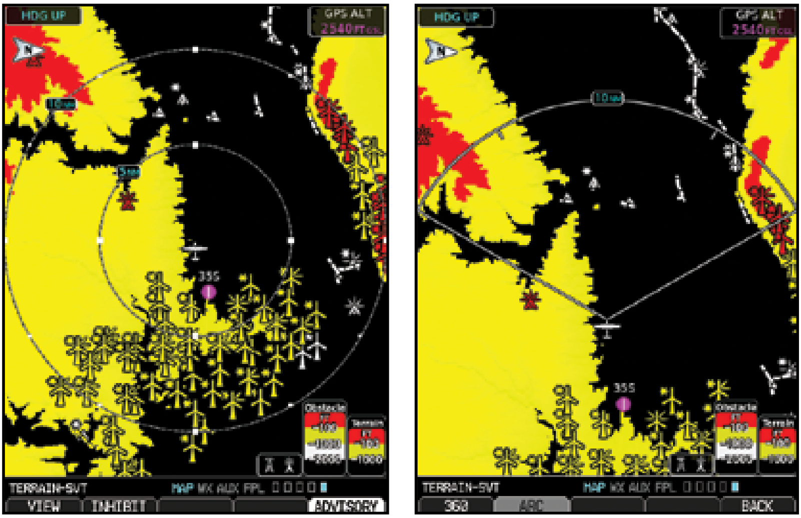

HDG UP
GPS ALT
2540FT
10
5
355
Obstacle
Terrain
TERRAIN-SVT
MAP WX AUX FPL
VIEW
INHIBIT
ADVISORY
HDG UP
GPS ALT
2540FT
10
355
Obstacle
Terrain
TERRAIN-SVT
MAP WX AUX FPL
360
ARC
BACK

Figure 4-23 Terrain-SVT 360 and Arc Views

1. Press **VIEW** and then the **360** or **Arc** soft key.

   OR

2. Press **MENU** and the with the "View Arc" or "View 360°" selection highlighted press **ENT**.

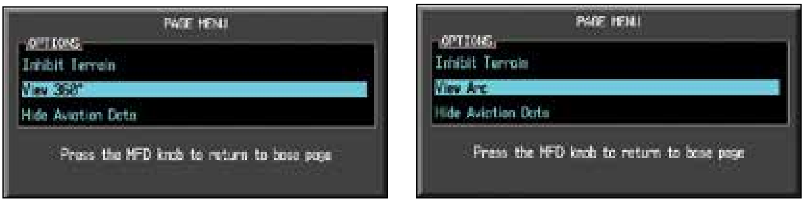

PAGE MENU
OPTIONS
Inhibit Terrain
View 360°
Hide Aviation Data
Press the MFD knob to return to base page
PAGE MENU
OPTIONS
Inhibit Terrain
View Arc
Hide Aviation Data
Press the MFD knob to return to base page

Figure 4-24 Terrain-SVT Page Menu Viewing Selections

4.6.2 Terrain-SVT Page Aviation Data

Select the display of Aviation data on the Terrain-SVT page. The Page Menu selections allow you to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

1) While viewing the Terrain page of the MAP page group, press **MENU** for Map selections to hide or show aviation data overlay on the Terrain or the Map Setup options for the Navigation Map pages.

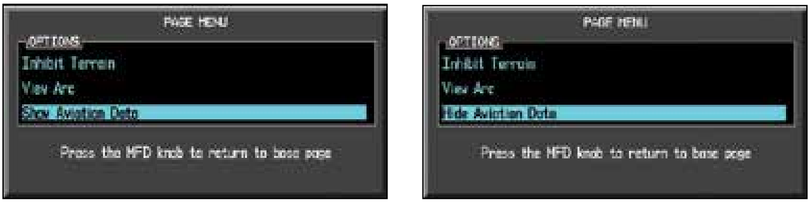

PAGE MENU
OPTIONS
Inhibit Terrain
View Arc
Show Aviation Data
Press the MFD knob to return to base page
PAGE MENU
OPTIONS
Inhibit Terrain
View Arc
Hide Aviation Data
Press the MFD knob to return to base page

Figure 4-25 Show/Hide Aviation Data on the Terrain-SVT Page

2) Press **ENT** to save the highlighted value.

4.6.3 Inhibiting/Enabling Terrain-SVT Alerting

Terrain-SVT has an inhibit mode that deactivates the FLTA aural and visual alerts. Pilots should use discretion when inhibiting Terrain-SVT and always remember to enable the system when appropriate.

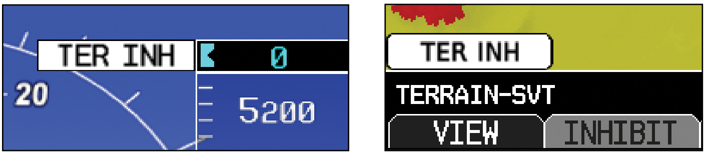

TER INH
20
0
5200
TER INH
TERRAIN-SVT
VIEW
INHIBIT

Figure 4-26 Terrain-SVT Alerting Disabled (Alerts Inhibited) Annunciation (PFD & MFD)

1) In MAP page group, turn the small **MFD** knob to reach the Terrain SVT Page.

2) Press the **INHIBIT** soft key to inhibit or enable Terrain SVT (choice dependent on current state).

OR

1) Press the **MENU** key.

2) Use the large or small **MFD** knob to highlight "Inhibit Terrain" or "Enable Terrain" (choice dependent on current state) and press the **ENT** key.

4.6.4 Synthetic Vision Alerts and Annunciations

Terrain-SVT alerts typically employ a CAUTION or a WARNING alert severity level, or both. When an alert is issued, visual annunciations are displayed and aural alerts are simultaneously issued.

When an alert is issued, annunciations appear on the PFD and MFD (Terrain-SVT page only). The TAWS/Terrain Alert Annunciation is shown to the upper left of the Altimeter on the PFD and below the Terrain Legend on the MFD. If the Terrain-SVT page is not displayed at the time, a pop-up alert appears on the MFD. To acknowledge the pop-up alert:

Press the **CLR** key (returns to the currently viewed page)

OR

Press the **ENT** key (accesses the Terrain-SVT Page)

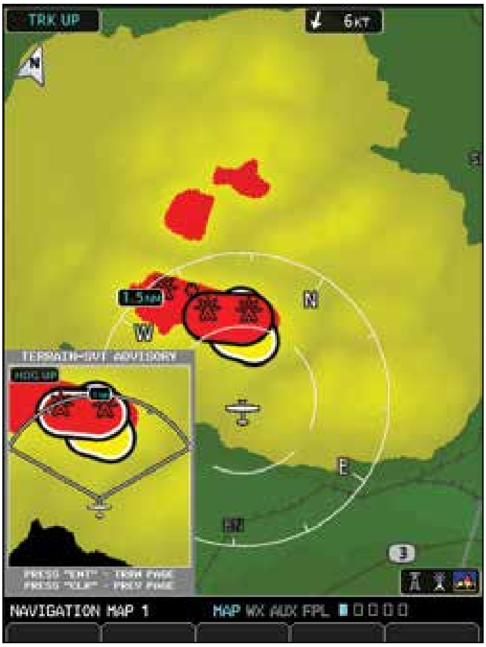


Figure 4-27 Terrain-SVT Advisory Pop-Up on the MFD

Alert Type	PFD/MFD Alert Annunciation	Aural Message
GPS signal re-established	None	"Terrain System Available"
Terrain System Test Successful	None	"Terrain System test OK"
Terrain System Test in Progress	TER TEST	None
Terrain Alerting is disabled	TER INH	None
No GPS position Excessively degraded GPS signal	TER N/A	"Terrain System Not Available"
Terrain SVT System Test Fail	TER FAIL	"Terrain System Failure"

Table 4-9 Terrain-SVT System Test Status Annunciations

Alert Type	PFD/MFD Alert Annunciation	Aural Message
FLTA Terrain Caution (RTC-C, ITI-C)	TERRAIN	"Caution, Terrain, Terrain"
FLTA Terrain Caution (RLC-C, ILI-C)	WIRE	"Caution, Wire, Wire"
FLTA Terrain Warning (RTC-W, ITI-W)	TERRAIN	"Warning, Terrain, Terrain"
FLTA Terrain Warning (RLC-W, ILI-W)	WIRE	"Warning, Wire, Wire"
FLTA Obstacle Caution (ROC-C, IOI-C)	OBSTACLE	"Caution, Obstacle, Obstacle"
FLTA Obstacle Warning (ROC-W, IOI-W)	OBSTACLE	"Warning, Obstacle, Obstacle"

Table 4-10 Terrain-SVT Alerts Summary

4.7 Traffic Systems

The Traffic function requires the installation of a compatible traffic device and will then provide a separate traffic page in the Map page group as well as the overlay of traffic on the Map Navigation pages. TIS and TAS cannot be displayed at the same time. If the aircraft has a TAS unit installed, the GDU 620 will be configured for TAS. If no TAS unit is installed and a GTX Mode-S transponder is installed then the GDU 620 will be configured for TIS. A pilot can tell which data is being displayed by the label in the top left corner (TAS/TCAS: OPER for TAS/TCAS data and TIS: OPER for TIS data). TIS data comes from a GTX transponder. Coverage is limited to specific areas as shown in the Airmen's Information Manual (AIM). TAS data comes from a TAS unit such as a Garmin GTS 800 or 820, Skywatch 497, KTA 810, or other unit. Coverage follows the aircraft. In the Navigation Map page setup you can select the maximum range at which traffic symbols are shown. Once outside of the selected range, traffic will be decluttered. The Traffic soft key will still be available. The Garmin GDL 88 can provide TIS-B and ADS-B information. The Garmin GTS ADS-B products can also provide ADS-B information.

4.7.1 TAS/TCAS 1 Traffic (Optional)

TAS refers to an active Traffic Advisory System that may be optionally displayed on the PFD and/or MFD. The TAS is installed separately from the G500/600 system. There are variations in performance and control among the various G500/600-compatible TAS systems. Refer to the appropriate TAS documentation for detailed information on the operation of the TAS system. This section describes the display and control functions available on the G500/600 system.

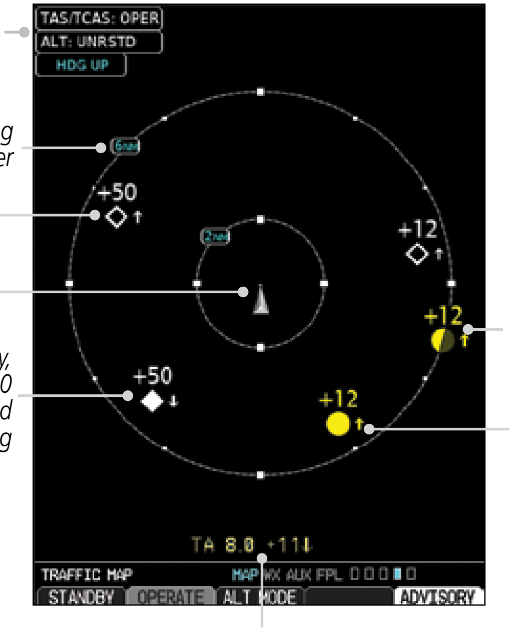
NOTE: TIS and TAS are mutually exclusive.

NOTE: Aircraft without an operating transponder are invisible to both Traffic Advisory Systems (TAS) and TIS. Aircraft without altitude reporting capability are shown without altitude separation data or climb descent indication.

NOTE: Traffic is also displayed in the SVT feature on the PFD.

4.7.1.1 Displaying and Operating Traffic (TAS/TCAS Systems)

The Traffic Map Page shows surrounding TAS/TCAS traffic data in relation to the aircraft's current position and altitude. Traffic page orientation is always heading up. The traffic mode and altitude filter mode are annunciated in the upper left corner.



Operating Mode

Range Ring Diameter

Non-Threat Traffic

Ownship Symbol

Traffic Advisory, Aircraft is 5000 ft Above and Descending

Traffic Advisory, Off Scale Aircraft is Out of Range, 1200 ft Above and Climbing

Proximity Advisory, 1200 ft Above and Climbing

Non-Bearing Traffic (System is Unable to Determine Bearing), Aircraft Distance is 8.0 NM, 1100 ft Above and Descending

Figure 4-28 Traffic Map Page - TAS/TCAS

4.7.1.2 Switching from Standby Mode to Operating Modes

The unit must be in operating mode for traffic to be displayed.

1) While viewing the Traffic Page of the MAP page group, select the **OPERATE** soft key to select Operating Mode.

2) To switch to Standby Mode from the Traffic Page, select the **STANDBY** soft key.

NOTE: *Not all TAS systems can be controlled from the G500/600. The Operate/Standby soft keys may not be displayed. An alert will be generated when Standby is selected and the aircraft is in the air.*

4.7.1.3 Range Ring

Pressing the **RNG** keys will zoom in and out in preset steps depending on the installed equipment.

4.7.1.4 Altitude Display

Changing the altitude display mode

1) Press the **ALT MODE** soft key to change the altitude filter.
2) Select the desired altitude filter by pressing the **BELOW**, **NORMAL**, **ABOVE**, or **UNRSTD** (unrestricted) soft keys. The selection is displayed in the Altitude mode field.

Altitude Mode	Displayed Traffic Range
Below	-9900 feet to 2700 feet
Normal	-2700 feet to 2700 feet
Above	-2700 feet to 9900 feet
Unrestricted	All Traffic Shown (-9900 to 9900 feet)

Table 4-11 Displayed Traffic Range

NOTE: *Traffic Advisories (TAs) are always displayed, regardless of altitude mode.*

4.7.1.5 TAS/TCAS Symbology

Traffic is displayed using four different symbols.

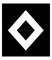
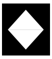
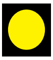
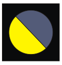
TAS Symbol	Description
	Other Traffic
	Proximity Advisory (PA)
	Traffic Advisory (TA)
	Traffic Advisory Off Scale

Table 4-12 TAS/TCAS Traffic Symbol Description

The traffic system determines the type of symbol used for each target. Refer to the traffic system documentation for information regarding the criteria used to determine target type.

A Traffic Advisory (TA) alerts the crew to a potentially hazardous intruding aircraft. Closing rate, distance, and vertical separation meet TA criteria for the specific traffic system. A Traffic Advisory that is beyond the selected display range is indicated by a half TA symbol at the edge of the screen at the relative bearing of the intruder.

4.7.1.6 Traffic System Status

***NOTE:** Refer to the equipment documentation for information on the self-test and operating modes.*

The traffic mode is indicated in the upper left corner of the Traffic Map Page.

Mode	Traffic Mode Annunciation (Traffic Map Page)
TAS Self-test Initiated	**TEST** (also shown in white in center of page)
TAS Operating	**OPERATING**
TAS Standby	**STANDBY** (also shown in white in center of page)

Table 4-13 TAS Modes

If the unit fails, an annunciation as to the cause of the failure is shown in the center of the Traffic Map Page.

Traffic Map Page Annunciation	Description
NO DATA	Data is not being received from the TAS unit.
TRFC FAIL	TAS unit has failed (unit is self-reporting a failure or sending incorrectly formatted data).
NO TRFC DATA	Data is not being received from the TAS unit.
DATA FAILED	Data is being received from the TAS unit, but the unit is self-reporting a failure.
FAILED	Incorrect data format received from the TAS unit.

Table 4-14 TAS Failure Annunciations

The annunciations to indicate the status of traffic information appear in a banner at the lower left corner of maps on which traffic can be displayed.

Traffic Status Banner Annunciation	Description
TA OFF SCALE*	A Traffic Advisory is outside the selected display range Annunciation is removed when traffic comes within the selected display range.
TA X.X ± XX ↕**	System cannot determine bearing of Traffic Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending).
TA/ X.XNM/± XX ↕**	System cannot determine bearing of Traffic Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending). The system distance units are set to Metric or Imperial and are shown as such in all other cases except for the traffic distance annunciation.

**Shown as symbol on Traffic Map Page*
***Shown centered on the bottom of Traffic Map Page*

Table 4-15 TAS Traffic Status Annunciations

For TAS traffic, TEST MODE can be initiated from the Page Menu (press the **MENU** key) when the traffic device is in Standby mode.

4.7.1.7 Traffic Pop-Up

When the GDU 620 MFD is displaying any page (other than the Traffic page) and a traffic alert becomes active, the Traffic pop-up will be displayed.

***NOTE:** The traffic pop-up will not appear when your aircraft is on the ground.*

Press **ENT** to go directly to the Traffic page.

OR

Press **CLR** to return to the previously viewed page.

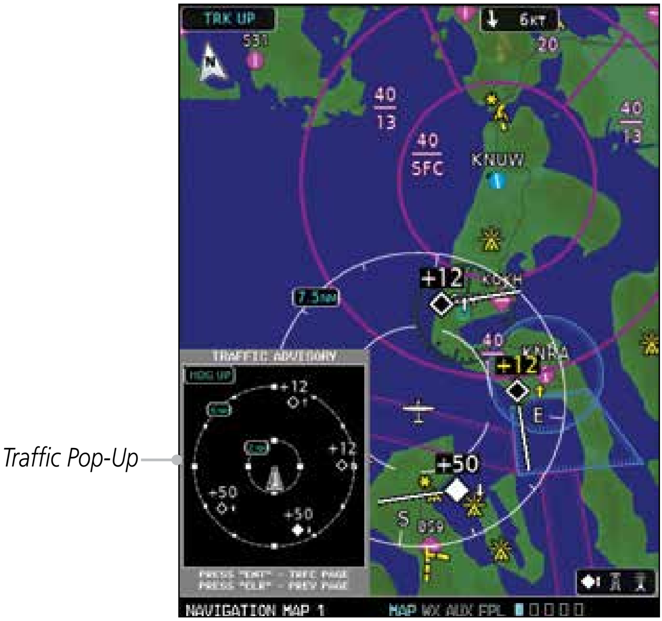

Traffic Pop-Up
TRK UP
531
6KT
20
40
13
40
SFC
KNUW
40
13
7.5NM
+12
KOKH
40
KNRA
+12
E
+50
S
059
TRAFFIC ADVISORY
HDG UP
+12
+12
+50
+50
PRESS "ENT" - TRFC PAGE
PRESS "CLR" - PREV PAGE
NAVIGATION MAP 1
MAP WX AUX FPL

Figure 4-29 Traffic Pop-Up

4.7.2 TIS Traffic (Optional)

***WARNING**: The Traffic Information Service (TIS) is intended for advisory use only. TIS is intended to help the pilot locate traffic visually. It is the responsibility of the pilot to see and maneuver to avoid traffic.*

***NOTE:** TIS is available only when the aircraft is within the service volume of a TIS-capable terminal radar site. Aircraft without an operating transponder are invisible to both Traffic Advisory Systems (TAS) and TIS. Aircraft without altitude reporting capability are shown without altitude separation data or climb descent indication.*

***NOTE:** TIS and TAS are mutually exclusive.*

The type of traffic systems that is installed is determined by the traffic page display in the upper left corner of the MFD.

If Traffic Information Service (TIS) is configured, TIS will be displayed in the upper left corner of the MFD.

Traffic Information Service (TIS) is designed to help in detection and avoidance of other aircraft. TIS uses the Mode S transponder for the traffic data link. TIS receives traffic information from ground stations, and is updated every five seconds. The GDU 620 displays up to eight traffic targets within a 7.5 NM radius, from 3000 feet below to 3500 feet above the requesting aircraft. Traffic is displayed according to TCAS symbology using three different symbols.

4.7.2.1 Traffic Map Page

The Traffic Map Page is configured to show surrounding TIS traffic data in relation to the aircraft's current position and altitude, without clutter from the basemap. Aircraft orientation on this map is always heading up unless there is no valid heading.

The traffic mode is annunciated in the upper left corner of the Traffic Map Page. When the aircraft is on the ground, TIS automatically enters Standby Mode. Once the aircraft is airborne, TIS switches from Standby to Operating Mode and the GDU 620 begins to display traffic information.

Displaying traffic on the Traffic Map Page

1) Turn the large **MFD** knob to select the Map Page Group.

2) Turn the small **MFD** knob to select the Traffic Map Page.

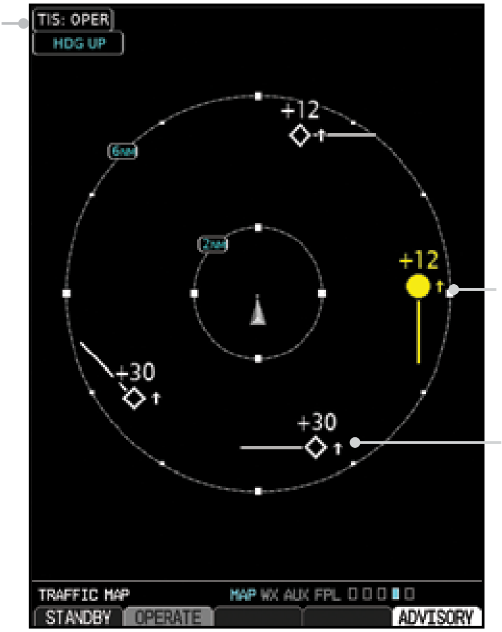
3) Confirm TIS is in Operating Mode:

   Select the **OPERATE** soft key to begin displaying traffic.

   OR

1) Press the **MENU** key.

2) Select Operate Mode (shown if TIS is in Standby Mode) and then press the **ENT** key.



Operating Mode

Traffic Advisory, Aircraft is 1200 feet above, climbing, and moving in the direction of the line

Proximity Advisory, Aircraft is 3000 feet above, descending and moving in the direction of the line

Figure 4-30 Traffic Map Page - TIS

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.7.2.2 TIS Symbology

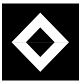
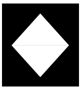
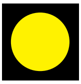
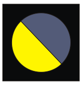
TIS Symbol	Description
	Non-Threat Traffic
	Proximity Advisory (PA)
	Traffic Advisory (TA)
	Traffic Advisory Off Scale

Table 4-16 TIS Traffic Symbols

A Traffic Advisory (TA) alerts the crew to a potentially hazardous intruding aircraft. Closing rate, distance, and vertical separation meet TA criteria. A Traffic Advisory that is beyond the selected display range is indicated by a half TA symbol at the edge of the screen at the relative bearing of the intruder.

TIS also provides a vector line showing the direction in which the traffic is moving, to the nearest 45°. Traffic information for which TIS is unable to determine the bearing (non-bearing traffic) is displayed in the bottom center of the Traffic Map Page or in a banner at the lower left corner of other map pages on which traffic can be displayed.

The altitude difference between the requesting aircraft and other intruder aircraft is displayed above/below the traffic symbol in hundreds of feet. If the other aircraft is above the requesting aircraft, the altitude separation appears above the traffic symbol; if below, the altitude separation appears below. Altitude trend is displayed as an up/down arrow (for speeds greater than 500 fpm in either direction) to the right of the target symbol. Traffic symbols for aircraft without altitude reporting capability appear without altitude separation or climb/descent information.

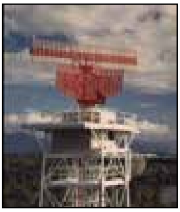
4.7.2.3 TIS Limitations

NOTE: *This section on TIS Limitations is not comprehensive. Garmin recommends the user review the TIS Limitations section of the Aeronautical Information Manual, Section 1-3-5.*

TIS is NOT intended to be used as a collision avoidance system and does not relieve the pilot of responsibility to "see and avoid" other aircraft. TIS should not be used for avoidance maneuvers during IMC or other times when there is no visual contact with the intruder aircraft. TIS is intended only to assist in visual acquisition of other aircraft in VMC. No recommended avoidance maneuvers are provided for, nor authorized, as a direct result of a TIS intruder display or TIS advisory.

While TIS is a useful aid to visual traffic avoidance, it has some system limitations that must be fully understood to ensure proper use. Many of these limitations are inherent in secondary radar surveillance. In other words, the information provided by TIS will be no better than that provided to ATC. TIS will only display aircraft with operating transponders installed.

TIS relies on surveillance of the Mode S radar, which is a "secondary surveillance" radar similar to the ATCRBS. TIS operation may be intermittent during turns or other maneuvering. TIS is dependent on two-way, "line-of-sight" communication between the aircraft and the Mode S radar. Whenever the structure of the client aircraft comes between the transponder antenna (usually located on the underside of the aircraft) and the ground-based radar antenna, the signal may be temporarily interrupted. Other limitations and anomalies associated with TIS are described in the AIM, Section 1-3-5.



Garmin is not responsible for Mode S geographical coverage. Operation of the ground stations is the responsibility of the FAA. Refer to the Aeronautical Information Manual for a Terminal Mode S Radar Site Map covering the U.S.

NOTE: *TIS will be unavailable at low altitudes in many areas of the U.S., particularly in mountainous regions. Also, when flying near the "floor" of radar coverage in a particular area, intruders below the client aircraft may not be detected by TIS.*

TIS information is collected one radar scan prior to the scan during which the uplink occurs. Therefore, the surveillance information is approximately five seconds old. In order to present the intruders in a "real time" position, the TIS ground station uses a "predictive algorithm" in its tracking software. This algorithm uses track history data to extrapolate intruders to their expected positions consistent with the time of display in the cockpit. Occasionally, aircraft maneuvering will cause this algorithm to induce errors in the display. These errors primarily affect relative bearing information and traffic target track vector (it will lag); intruder distance and altitude will remain relatively accurate and may be used to assist in "see and avoid." Some of the more common examples of these errors follow:

- When client or intruder aircraft maneuvers excessively or abruptly, the tracking algorithm may report incorrect horizontal position until the maneuvering aircraft stabilizes.
- When a rapidly closing intruder is on a course that crosses the client aircraft course at a shallow angle (either overtaking or head on) and either aircraft abruptly changes course within 0.25 NM, TIS may display the intruder on the opposite side of the client than it actually is.

These are relatively rare occurrences and will be corrected in a few radar scans once the course has stabilized.

4.7.2.4 TIS Alerts

When the number of Traffic Advisories (TAs) on the Traffic Map Page increases from one scan to the next, the following occur:

- A single "Traffic" voice alert is generated.
- A TRAFFIC Annunciation appears to the top left of the Attitude Indicator on the PFD, flashing for 5 seconds and remaining displayed until no TAs are detected in the area.

  To reduce the number of nuisance alerts due to proximate aircraft, the "Traffic" voice alert is generated only when the number of TAs increases. For example, when the first TA is displayed, a voice and visual annunciation are generated. As long as a single TA remains on the display, no additional voice alerts are generated. If a second TA appears on the display or if the number of TAs initially decreases and then subsequently increases, another voice alert is generated.

A "Traffic Not Available" (TNA) voice alert is generated when the TIS service becomes unavailable or is out of range.

Traffic may not be displayed in the radar coverage area due to the following:

- Radar site TIS Mode S sensor is not operational or is out of service.
- Traffic or requesting aircraft is beyond the maximum range of the TIS-capable Mode S radar site.
- Traffic or requesting aircraft is above the radar site in the cone of silence and out of range of an adjacent site.
- Traffic or requesting aircraft is below radar coverage. In flat terrain, the coverage extends from about 3000 feet upward at 55 miles. Terrain and obstacles around the radar site can further decrease radar coverage in all directions.
- Traffic does not have an operating transponder.

4.7.2.5 TIS System Status

The GDU 620 performs an automatic test of TIS during power-up. If TIS passes the test, TIS enters Standby Mode on the ground or Operating Mode in the air. If TIS fails the power up test, an annunciation is shown in the center of the Traffic Map Page.

Traffic Map Page Annunciation	Description
NO DATA*	Data is not being received from the transponder
DATA FAILED*	Data is being received from the transponder, but a failure is detected in the data stream
FAILED*	The transponder has failed
UNAVAILABLE	TIS is unavailable or out of range

** Contact a service center or Garmin dealer for corrective action*

Table 4-17 TIS Failure Annunciations

The traffic mode is annunciated in the upper left corner of the Traffic Map Page. When the aircraft is on the ground, TIS automatically enters Standby Mode. If traffic is selected for display on another map while Standby Mode is selected, the traffic display enabled icon is crossed out (also the case when TIS has failed). Once the aircraft is airborne, TIS switches to Operating Mode and traffic information is displayed. The mode can be changed manually using soft keys or the page menu.

Mode	Traffic Mode Annunciation (Traffic Map Page)	Traffic Display Enabled Icon (Other Maps)
TIS Operating	OPERATING	◆↑
TIS Standby	STANDBY (Also shown in white in center of page)	☒
TIS Failed*	FAIL	☒

Table 4-18 TIS Modes

Switching Between TIS Operating Modes

1) Turn the large **MFD** knob to the MAP page group and then turn the small **MFD** knob to the Traffic Map Page.

2) Select the **STANDBY** or **OPERATE** soft key to switch between modes. The mode is displayed in the upper left corner of the Traffic Map Page.

OR

1) Press the **MENU** key.

2) Select Operate mode or Standby mode whether airborne or on the ground.

3) Press the **ENT** key.

***NOTE:** An alert will be generated when Standby is selected and the aircraft is in the air.*

The annunciations indicate the status of traffic information appear in a banner at the lower left corner of maps on which traffic can be displayed.

Traffic Status Banner Annunciation	Description
TA OFF SCALE*	A Traffic Advisory is outside the selected display range. Annunciation is removed when traffic comes within the selected display range.
TA X.X ± XX↕**	System cannot determine bearing of Traffic Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending).
TA/ X.XNM/± XX↕ **	System cannot determine bearing of Traffic Advisory. Annunciation indicates distance in NM, altitude separation in hundreds of feet, and altitude trend arrow (climbing/descending). The system distance units are set to Metric or Imperial and are shown as such in all other cases except for the traffic distance annunciation.
AGE MM:SS	Appears if traffic data is not refreshed within 6 seconds. If after another 6 seconds data is not received, traffic is removed from the display. The quality of displayed traffic information is reduced as the age increases.
TRFC COAST	The displayed data is not current (6 to 12 seconds since last message). The quality of displayed traffic information is reduced when this message is displayed.
TRFC RMVD	Traffic is removed because it is too old for coasting (12 to 60 seconds since last message). Traffic may exist within the selected display range, but it is not displayed.
TRFC FAIL	Traffic data has failed.
NO TRFC DATA	Traffic has not been detected.
TRFC UNAVAIL	The traffic service is unavailable or out of range.

**Shown as symbol on Traffic Map Page*
***Shown centered on the bottom of Traffic Map Page*

Table 4-19 TIS Traffic Status Annunciations

4.7.3 ADS-B Traffic (Optional)

ADS-B In allows a properly-equipped aircraft to receive TIS-B and other aircraft equipped with ADS-B out capability.

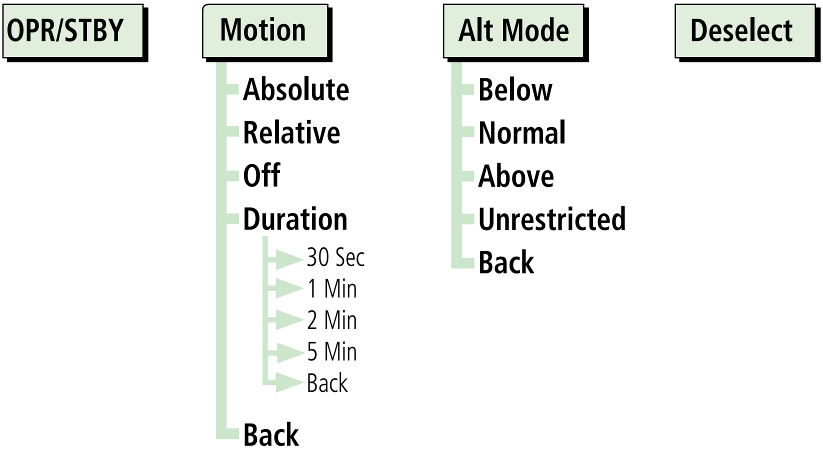

OPR/STBY
Motion
Absolute
Relative
Off
Duration
30 Sec
1 Min
2 Min
5 Min
Back
Back
Alt Mode
Below
Normal
Above
Unrestricted
Back
Deselect

Figure 4-31 ADS-B Traffic Page Functional Diagram

When in Standby mode, pressing the **MENU** key will show the Page menu where the traffic LRU can be placed into TEST mode.

4.7.3.1 Target Selection

Traffic targets displayed on the dedicated traffic page may be selected in order to obtain additional information about a traffic target.

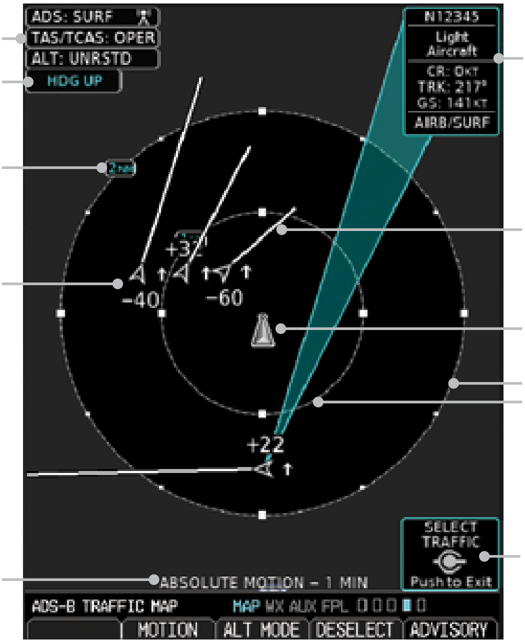
1) Press the small **MFD** knob to start target selection.

2) Turn the small or large **MFD** knobs clockwise or counter-clockwise to step through selection of the available targets.

3) After selecting a target, you can press the small **MFD** knob to leave the target selected, and return the small **MFD** to page selection mode.

4) Use the **DESELECT** softkey to turn off selected traffic.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index


ADS: SURF
TAS/TCAS: OPER
ALT: UNRSTD
HDG UP
2 NM
N12345
Light Aircraft
CR: 0KT
TRK: 217°
GS: 141KT
AIRB/SURF
+32
-40
-60
+22
SELECT TRAFFIC
Push to Exit
ABSOLUTE MOTION - 1 MIN
ADS-B TRAFFIC MAP
MAP WX AUX FPL
MOTION
ALT MODE
DESELECT
ADVISORY

ADS-B and TCAS Status and Altitude Filter

Map Orientation

Range Ring Radius

Basic Directional Traffic, 4000 ft Below and Climbing

Selected Vector Motion and Duration

Selected Traffic Info

Traffic Motion Vector

Ownship Icon

Range Rings

Turn Cursor Knob for Next Target

Figure 4-32 ADS-B Traffic Page (Absolute Motion)

NOTE: *Traffic targets within 1200 ft vertical separation and 6NM from the ownship are depicted as proximate targets.*

Symbol	Description
◇	Basic Non-Directional Traffic
△	Basic Directional Traffic
▽	Basic Off-scale Selected Traffic
◆	Proximate Non-Directional Traffic
▲	Proximate Directional Traffic
▼	Proximate Off-scale Selected Traffic
●	Non-Directional Alerted Traffic

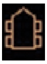
Symbol	Description
	Off-Scale Non-Directional Alerted Traffic
	Directional Alerted Traffic
	Off-Scale Directional Alerted Traffic
	Non-Directional Surface Vehicle
	Directional Surface Vehicle

Table 4-20 ADS-B Traffic Symbols

NOTE: *Color of basic and proximate traffic is dependent on airborne/on-ground status of target (target is brown when on the ground, see the surface vehicles).*

4.7.3.2 Status

ADS-B Status

ADS-B Status displays the current status of traffic application: Off, Surface, Airborne, N/A, Fail, or Test.

TCAS Status

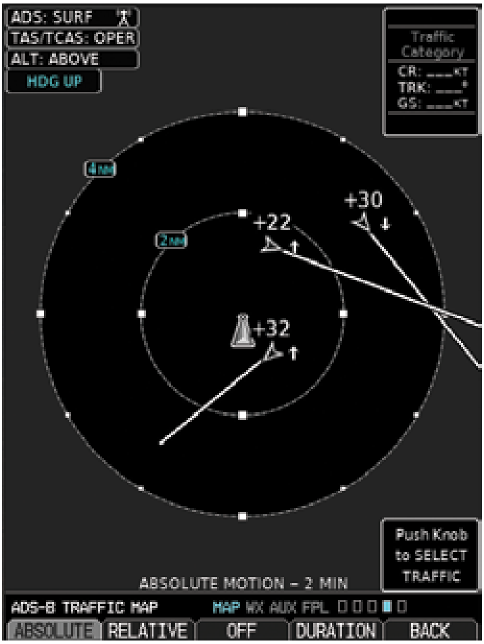
If a TCAS system is integrated with the ADS-B system then this shows the current status of the TCAS system.

When the ADS-B system is integrated with a TCAS system, the controls are provided on the installed navigator.

4.7.3.3 Motion Vector

When Absolute Motion Vectors are selected, the vectors extending from the traffic targets depict the target reported track and speed over the ground. When Relative Motion Vectors are selected, the vectors extending from the traffic targets display how the traffic target is moving relative to your aircraft. These vectors are calculated using the traffic targets track and ground speed and your aircraft's track and ground speed. These two values are combined to depict where the traffic target is moving with respect to your aircraft and indicates where the traffic target will be, relative to your aircraft, at the time specified by the length of the vector.

***NOTE:** Absolute motion vectors match the color of the intruder (white or yellow). Relative motion vectors are green except for Traffic Advisories whose Relative Motion vectors are yellow. The annunciation on the bottom of the dedicated traffic page indicates which vector type is selected and their length.*



ADS: SURF
TAS/TCAS: OPER
ALT: ABOVE
HDG UP
ABSOLUTE MOTION - 2 MIN

Figure 4-33 Absolute Motion (White Vectors)

***NOTE:** Relative Motion vectors are unavailable when the aircraft is on the ground. The duration will be annunciated as UNAVAIL after "RELATIVE MOTION -" at the bottom of the screen.*

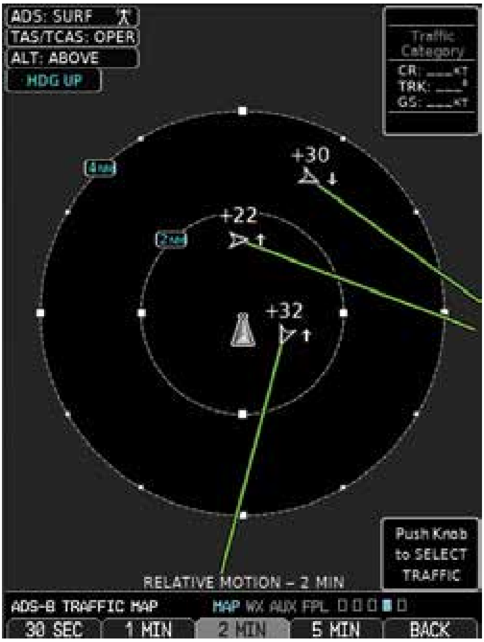

ADS: SURF
TAS/TCAS: OPER
ALT: ABOVE
HDG UP
Traffic Category
CR: ___KT
TRK: ___°
GS: ___KT
4 NM
2 NM
+30
+22
+32
Push Knob to SELECT TRAFFIC
RELATIVE MOTION – 2 MIN
ADS-B TRAFFIC MAP
MAP WX AUX FPL
30 SEC
1 MIN
2 MIN
5 MIN
BACK

Figure 4-34 Relative Motion (Green Vectors)

Vector Duration

The Vector Duration selection sets the time that the vector will show the calculated distance and direction of the traffic target. A longer duration will result in a longer vector. Press the smart key for the desired duration.

Altitude Filter

The Altitude Filter limits the traffic displayed to the Below, Normal, Above or Unrestricted altitude block as listed in the "Displayed Traffic Range" table. The filter altitudes are relative to ownship altitude. Press the Alt Mode smart key to display the altitude smart keys. Press the smart key to select the altitude filter value.

Altitude Mode	Displayed Traffic Range
Below	-9900 ft to 2700 ft
Normal	-2700 ft to 2700 ft
Above	-2700 ft to 9900 ft
Unrestricted	All Traffic Shown (-9900 to 9900 feet)

Table 4-21 Displayed Traffic Range

4.8 XM WX Satellite Weather (Optional)

The primary map for viewing XM WX Satellite Weather data are the Weather Data Link Pages in the Map Page Group. These are the only GDU 620 map displays capable of all available XM WX Satellite weather products. The XM WW Satellite Weather pages may be oriented to either Track Up or North Up.

4.8.1 Using XM WX Satellite Weather Products

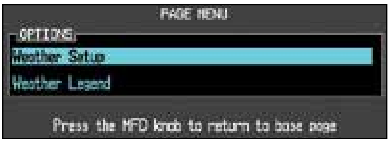
When a weather product is active on the Weather Data Link Page or the Navigation Map Page, the age of the data is displayed on the screen. The age of the product is based on the time difference between when the data was assembled on the ground and the current GPS time. Weather products are refreshed at specific intervals (defined in the Refresh Rate column).

If a weather product is not received within the 30, 60, 90, or 120 minute Expiration Time intervals, the data is considered expired and is removed from the display. This ensures that the displayed data is consistent with what is currently being broadcast by XM WX Satellite Radio services. If more than half of the expiration time has elapsed from the time the data is received, the color of the product age displayed changes to yellow.

4.8.2 Customizing the XM WX Satellite Weather Map

Each Wx Data Link Map page may be customized individually. The Wx Data Link Map pages are customized by selecting options from the Page Menu. The Page Menu options include choices for Weather Setup and displaying the Weather Legends. The Weather Setup choice covers selections for adjusting the viewing ranges of the weather products.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**



Press the MFD knob to return to base page

Figure 4-35 Weather Page Menu Options

2) Turn the Large or Small **MFD** knob to select Weather Setup (1/2) or Weather Setup (2/2) and press **ENT**.

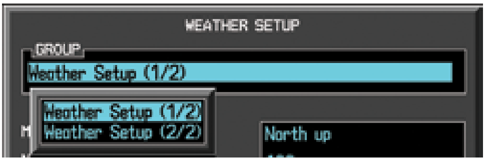


Figure 4-36 Weather Setup Group Selection

3) With the Data Link Setup Menu displayed, turn the Large **MFD** knob to highlight the desired item and then turn the small **MFD** knob to select the desired weather feature value. Where a value (such as 100 NM) is selected, weather data will be shown at map ranges of the selected value (100 NM) and lower.

4) Press **ENT** to save a selection.

5) Turn the large **MFD** knob to the next desired option or press the small **MFD** knob to cancel and return to the XM WX Satellite Weather Data Link Map Page.

WX Page Menu - Weather Setup	
Menu Item	**Adjustment**
Map Orientation	North Up, Track Up
NEXRAD Data Viewing Range	Off, 10 NM to 500 NM
NEXRAD Legend	On/Off
Source	US, Canada
Echo Top Data Viewing Range	Off, 10 NM to 500 NM
Cloud Top Data Viewing Range	Off, 10 NM to 500 NM
Lightning Data Viewing Range	Off, 10 NM to 500 NM
Cell Mov Data Viewing Range	Off, 10 NM to 500 NM
SIG/AIR Viewing Range	Off, 10 NM to 500 NM
PIREPS Data Viewing Range	Off, 10 NM to 500 NM
METAR Data Viewing Range	Off, 10 NM to 500 NM
Surface Data Viewing Range	Off, 10 NM to 500 NM
Frz Lvl Data Viewing Range	Off, 10 NM to 500 NM
Wnds Aloft Data Viewing Range	Off, 10 NM to 500 NM
County Data Viewing Range	Off, 10 NM to 500 NM
TFR Data Viewing Range	Off, 10 NM to 500 NM
AIREPS Data Viewing rnage	Off, 10 NM to 500 NM
Icing Data Viewing Range	Off, 10 NM to 500 NM
Turbulence Data Viewing Range	Off, 10 NM to 500 NM
Cyclone Data Viewing Range	Off, 10 NM to 500 NM

Table 4-22 Weather Page Menu Setup Options

4.8.3 XM WX Weather Symbols and Product Age

The weather product symbols, the expiration time and the broadcast rate are shown in the following tables. The broadcast rate represents the interval at which XM WX Satellite Radio broadcasts new signals that may or may not contain new weather data. It does not represent the rate at which weather data is updated or new content is received by the Data Link Receiver. Weather data is updated at intervals that are defined and controlled by XM WX Satellite Radio and its data vendors.

The product label in the legend will turn yellow at half the expiration time and grey when expired. Expired products will not be shown on the display.

***WARNING:** Do not use data link weather information for maneuvering in, near, or around areas of hazardous weather. Information contained within data link weather products may not accurately depict current weather conditions.*

***WARNING:** Do not use the indicated data link weather product age to determine the age of the weather information shown by the data link weather product. Due to time delays inherent in gathering and processing weather data for data link transmission, the weather information shown by the data link weather product may be significantly older than the indicated weather product age.*

Weather Product	Expiration Time (Minutes)
NEXRAD (NEXRAD and Echo Top are Mutually Exclusive)	30
Echo Top (Cloud Top and Echo Top Mutually Exclusive) (NEXRAD and Echo Top Mutually Exclusive)	30
Cloud Top (Cloud Top and Echo Top Mutually Exclusive)	60
XM Lightning	30
Cell Movement	30
SIGMETs / AIRMETs	60
METARs	90
City Forecast	90
Surface Analysis	60
Freezing Levels	120
Winds Aloft	90
County Warnings	60
PIREPS	90
TFRs	60
AIREPS	90
Icing	90
Turbulence	180
Cyclone Warnings	60

Table 4-23 XM Weather Product Symbols and Data Timing

NOTE: *Product age for individual reports of XM AIRMETs, SIGMETs, City Forecasts, County Warnings, Cell Movement and TFRs are not provided by XM Weather Service.*

Product age indication for XM Icing Potential and Turbulence is not included on the weather map. The valid time for these products is displayed on the weather map in place of the generation time.

The valid time indication for XM Freezing Level, Winds Aloft and Canada Winds Aloft is not displayed. Instead, the generation time for these is displayed.

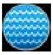
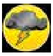
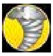
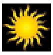
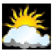
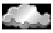
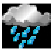
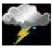
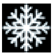
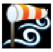
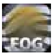
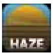
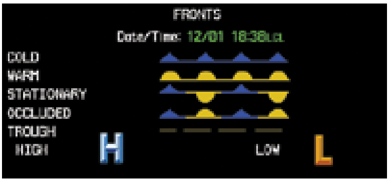
Symbol	Description
	Flood
	Severe Thunderstorm
	Tornado
	Sunny
	Part Sun
	Cloudy
	Rainy
	T-Storm
	Snow
	Windy
 FOG	Foggy
 HAZE	Haze
__/__F	High/Low Temp

Table 4-24 Weather Symbols

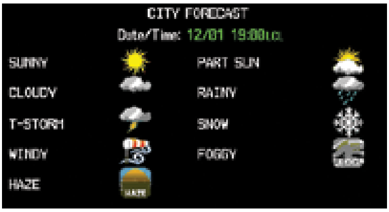
4.8.4 XM Weather Legends

The **LEGEND** soft key displays a pop-up legend of the currently used weather products. Pressing the **LEGEND** soft key again, the **MFD** knob, the **ENT**, or **CLR** keys will remove the legend.

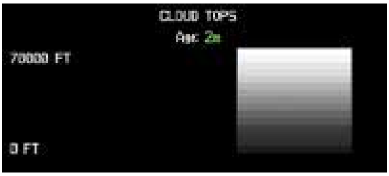
1) A full page legend can be selected by selecting the Weather Legend option in the XM Weather Map Menu or pressing the **LEGEND** soft key on the Weather Map Page. The legend displayed will match the selected weather products. Turn the large or small **MFD** knobs to scroll through the legend, if necessary.



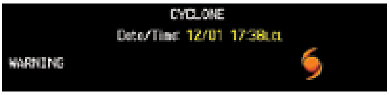
FRONTS
Date/Time: 12/01 18:38LCL
COLD
WARM
STATIONARY
OCCLUDED
TROUGH
HIGH H
LOW L



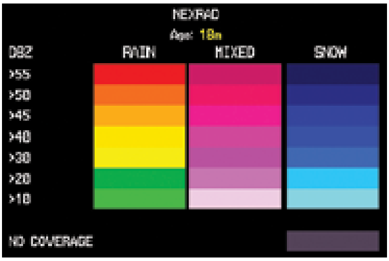
CITY FORECAST
Date/Time: 12/01 19:00LCL
SUNNY
PART SUN
CLOUDY
RAINY
T-STORM
SNOW
WINDY
FOGGY
HAZE



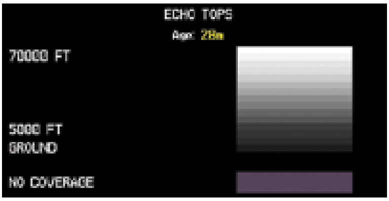
CLOUD TOPS
Age: 2m
70000 FT
0 FT



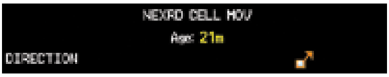
CYCLONE
Date/Time: 12/01 17:38LCL
WARNING



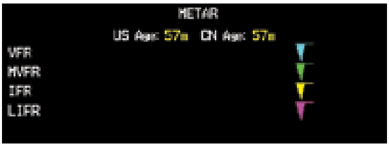
NEXRAD
Age: 18m
DBZ RAIN MIXED SNOW
>55
>50
>45
>40
>30
>20
>10
NO COVERAGE



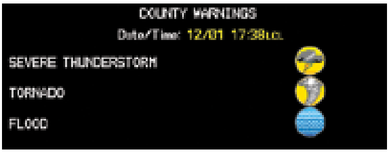
ECHO TOPS
Age: 28m
70000 FT
5000 FT
GROUND
NO COVERAGE



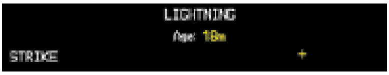
NEXRD CELL MOV
Age: 21m
DIRECTION



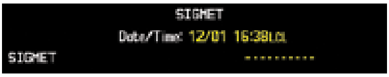
METAR
US Age: 57m CN Age: 57m
VFR
MVFR
IFR
LIFR



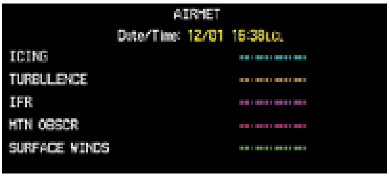
COUNTY WARNINGS
Date/Time: 12/01 17:38LCL
SEVERE THUNDERSTORM
TORNADO
FLOOD



LIGHTNING
Age: 18m
STRIKE +



SIGMET
Date/Time: 12/01 16:38LCL
SIGMET



AIRMET
Date/Time: 12/01 16:38LCL
ICING
TURBULENCE
IFR
MTN OBSCR
SURFACE WINDS

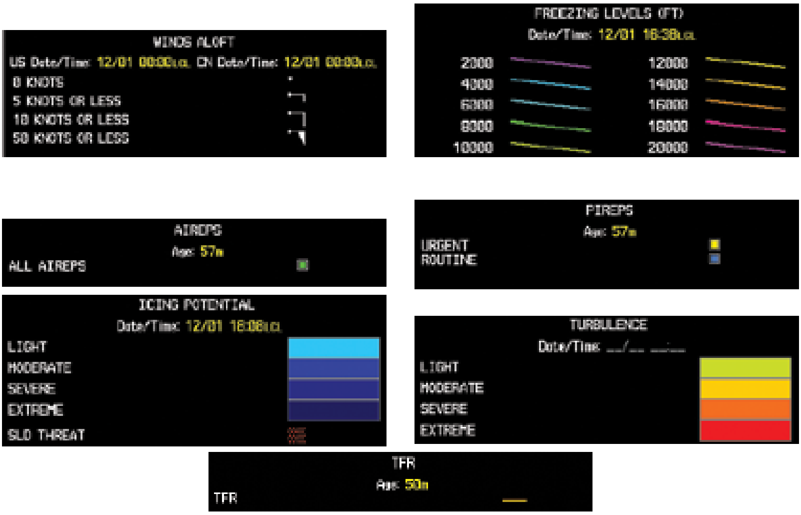

WINDS ALOFT
US Date/Time: 12/01 00:00LCL CN Date/Time: 12/01 00:00LCL
0 KNOTS
5 KNOTS OR LESS
10 KNOTS OR LESS
50 KNOTS OR LESS
FREEZING LEVELS (FT)
Date/Time: 12/01 16:38LCL
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
AIREPS
Age: 57m
ALL AIREPS
PIREPS
Age: 57m
URGENT
ROUTINE
ICING POTENTIAL
Date/Time: 12/01 16:08LCL
LIGHT
MODERATE
SEVERE
EXTREME
SLD THREAT
TURBULENCE
Date/Time: __/__ __:__
LIGHT
MODERATE
SEVERE
EXTREME
TFR
Age: 50m
TFR

Figure 4-37 Weather Legends

2) An abbreviated legend may be displayed on the upper right side of a WX Data Link Map page for the applicable weather products when selected in the Page Menu options for Weather.

4.8.5 XM NEXRAD

WSR-88D, or NEXRAD (NEXt-generation RADar), is a network of 158 high-resolution Doppler radar systems that are operated by the National Weather Service (NWS). NEXRAD data provides centralized meteorological information for the continental United States and selected overseas locations. The maximum range of a single NEXRAD radar site is 250 NM. The NEXRAD network provides important information about severe weather for air traffic safety.

NEXRAD data is not real-time. The lapsed time between collection, processing, and dissemination of NEXRAD images can be significant and may not reflect the current radar synopsis. Due to the inherent delays and the relative age of the data, it should be used for long-range planning purposes only. Never use NEXRAD data or any radar data to penetrate hazardous weather. Instead, use it in an early-warning capacity of pre-departure and en route evaluation.

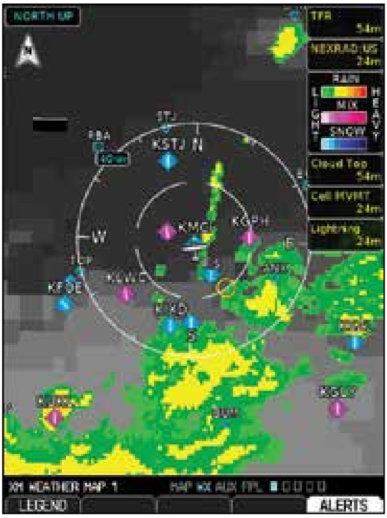
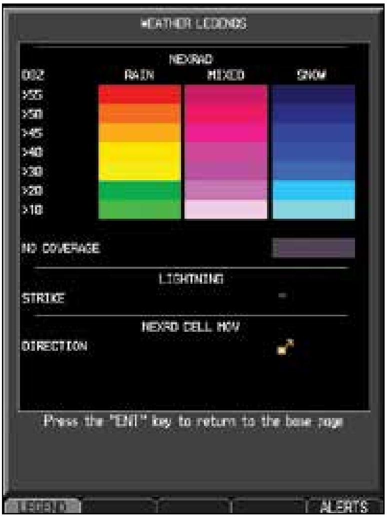

NORTH UP
TFR
54m
NEXRAD US
24m
RAIN
LIGHT
MIX
SNOW
HEAVY
Cloud Top
54m
Cell MVMT
24m
Lightning
24m
STJ
FBA
KSTJ
N
W
E
S
KMCI
KGPH
KFOE
KLWC
KIXD
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ALERTS

Figure 4-38 XM Weather - NEXRAD

Composite data from all the NEXRAD radar sites in the United States is shown. This data is composed of the maximum reflectivity from the individual radar sweeps. The display of the information is color-coded to indicate the weather severity level. All weather product legends can be viewed on the Weather Data Link Page. For the NEXRAD legend, select the **LEGEND** soft key when NEXRAD is selected for display.



WEATHER LEGENDS

NEXRAD

DBZ	RAIN	MIXED	SNOW
>55	🟥	🟥	🟦
>50	🟧	🟥	🟦
>45	🟧	🟪	🟦
>40	🟨	🟪	🟦
>30	🟨	🟪	🟦
>20	🟩	🟪	🟦
>10	🟩	⬜	🟦

NO COVERAGE ▨

LIGHTNING

STRIKE

NEXRD CELL MOV

DIRECTION

Press the "ENT" key to return to the base page

LEGEND
ALERTS

Figure 4-39 NEXRAD Weather Legend

The display of radar coverage is always active when either NEXRAD or ECHO TOPS is selected. Areas where NEXRAD radar coverage and Echo Tops information is not currently available or is not being collected are indicated in grayish-purple.

4.8.5.1 Reflectivity

Reflectivity is the amount of transmitted power returned to the radar receiver. Colors on the NEXRAD display directly correlate to the level of detected reflectivity. Reflectivity as it relates to hazardous weather can be very complex.

The role of radar is essentially to detect moisture in the atmosphere. Simply put, certain types of weather reflect radar better than others. The intensity of a radar reflection is not necessarily an indication of the weather hazard level. For instance, wet hail returns a strong radar reflection, while dry hail does not. Both wet and dry hail can be extremely hazardous.

The different NEXRAD echo intensities are measured in decibels (dB) relative to reflectivity (Z). NEXRAD measures the radar reflectivity ratio, or the energy reflected back to the radar receiver (designated by the letter Z). The value of Z increases as the returned signal strength increases.

4.8.5.2 NEXRAD Limitations

NEXRAD radar images may have certain limitations:

- NEXRAD composite reflectivity does not provide sufficient information to determine cloud layers or precipitation characteristics. For example, it is not possible to distinguish between wet snow, wet hail, and rain.
- NEXRAD composite reflectivity is sampled at the minimum antenna elevation angle. An individual NEXRAD site cannot depict high altitude storms at close ranges. It has no information about storms directly over the site.
- When zoomed in to a range of 30 NM, each square block on the display represents an area of four square kilometers. The intensity level reflected by each square represents the highest level of NEXRAD data sampled within the area.

The following may cause abnormalities in displayed NEXRAD radar images:

- Ground clutter
- Strobes and spurious radar data

- Sun strobes (when the radar antenna points directly at the sun)
- Interference from buildings or mountains, which may cause shadows
- Metallic dust from military aircraft, which can cause alterations in radar scans

NOTE: *At present, NEXRAD data can age significantly by the time the mosaic image is created. Although such situations are not believed to be typical, in extreme latency and mosaic-creation scenarios, the actual age of the oldest NEXRAD data in the mosaic can exceed the age indication in the cockpit by 15-20 minutes. Even small time differences between the age indicator and actual conditions can be important for safety of flight, especially when considering fast-moving weather hazards, quickly developing weather scenarios, and/or fast-moving aircraft.*

4.8.6 XM Weather Page Map Orientation

The Orientation option sets the orientation of the Wx Data Link Map pages.

1) While viewing the Wx Data Link Map 1, 2, or 3 of the Wx page group, press the **MENU** key. With “Weather Setup” highlighted, press **ENT**.

2) Turn the small **MFD** knob to select “Weather Setup 1/2” and press **ENT**.

3) With the “Map Orientation” option active, turn the small **MFD** knob to change the highlighted value.

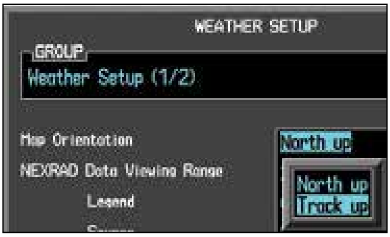


Figure 4-40 Weather Page Map Orientation

4) Press **ENT** to accept the displayed value. The next option will be highlighted.

5) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.8.7 NEXRAD Data Viewing Range

The NEXRAD Viewing Range option allows you to select the map range where at and below the selected value NEXRAD weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, NEXRAD weather data will not be shown. For the value (such as 100 NM) that is selected, NEXRAD data will be shown at the selected map ranges (such as 100 NM) and lower.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the small **MFD** knob to select "Weather Setup 1/2" and press **ENT**.

3) Turn the large **MFD** knob to highlight he NEXRAD Data Viewing Range value. Turn the small **MFD** knob to highlight the desired value.

4) Press **ENT** to accept the displayed value. The next option will be highlighted.

5) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4.8.8 NEXRAD Legend

The NEXRAD Legend selection provides the option of displaying an abbreviated version of the NEXRAD legend in the top right region of the MFD. The full legend is available by pressing the **LEGEND** soft key.

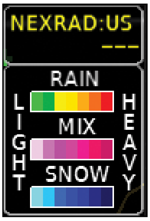


Figure 4-41 NEXRAD Legend Selection

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the NEXRAD Legend value.

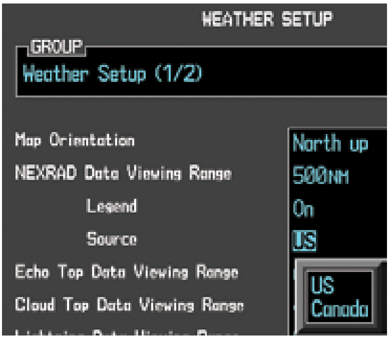
2) Turn the small **MFD** knob to highlight Off or On. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.8.9 NEXRAD Source

The NEXRAD Legend selection provides the option of using US or Canadian Nexrad data.



WEATHER SETUP

GROUP

Weather Setup (1/2)

Map Orientation	North up
NEXRAD Data Viewing Range	500NM
Legend	On
Source	US
Echo Top Data Viewing Range	
Cloud Top Data Viewing Range	

US
Canada

Figure 4-42 NEXRAD Source Selection

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the NEXRAD Legend value.

2) Turn the small **MFD** knob to highlight US or Canada. Press **ENT** to accept the displayed value.

4.8.10 XM Echo Tops

***NOTE:** Due to similarities in color schemes, the display of Echo Tops is mutually exclusive with Cloud Tops and NEXRAD.*

Echo Tops data shows the location, elevation, and direction of the highest radar echo. The highest radar echo does not indicate the top of a storm or clouds; rather it indicates the highest altitude at which precipitation is detected. Information is derived from NEXRAD data.

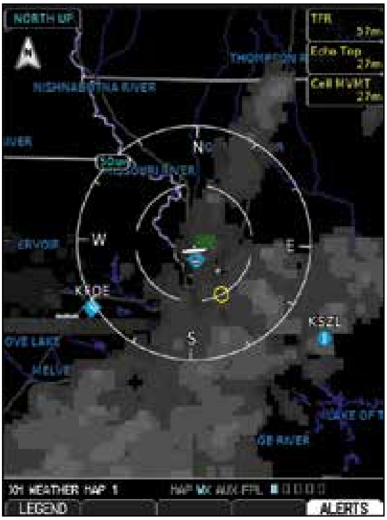


Figure 4-43 XM Weather - Echo Tops

The display of radar coverage is always active when either NEXRAD or ECHO TOPS is selected. Areas where NEXRAD radar coverage and Echo Tops information is not currently available or is not being collected are indicated in grayish-purple.

Echo Top Data Viewing Range

The Echo Top Data Viewing Range option allows you to select the map range where at and below that value Echo Top weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Echo Tops will not be shown. Where a value (such as 250 NM) is selected, Echo Top data will be shown at map ranges of the selected value (250 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the Echo Top Data Viewing Range value.
2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page, or turn the large **MFD** knob to the next option.

4.8.11 XM Cloud Tops

***NOTE:** Due to similarities in color schemes, the display of Cloud Tops is mutually exclusive with Echo Tops and NEXRAD.*

Cloud Tops data depicts cloud top altitudes as determined from satellite imagery.

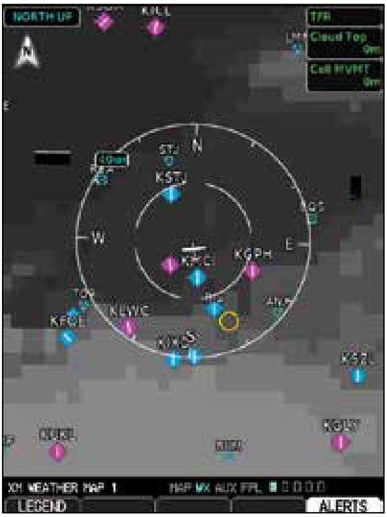

NORTH UP
KILL
TFR
Cloud Top
Cell MVMT
N
STJ
KSTJ
W
E
KGPH
KLWC
KFOE
S
KSZL
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ALERTS

Figure 4-44 XM Weather - Cloud Tops

To display the Cloud Tops legend, select the **LEGEND** soft key when Cloud Tops is selected for display. Since Cloud Tops and Echo Tops use the same color scaling to represent altitude, display of these weather products is mutually exclusive. When Cloud Tops is activated, Echo Tops or NEXRAD data is not shown.

Cloud Top Data Viewing Range

The Cloud Top Data Viewing Range option allows you to select the map range where at and below that value Cloud Top weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Cloud Tops will not be shown. Where a value (such as 150 NM) is selected, Cloud Top data will be shown at map ranges of that value (150 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the Cloud Top Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4.8.12 XM WX Satellite Lightning

Lightning data shows the approximate location of cloud-to-ground lightning strikes. A strike icon represents a strike that has occurred within a two-kilometer region. The exact location of the lightning strike is not displayed.

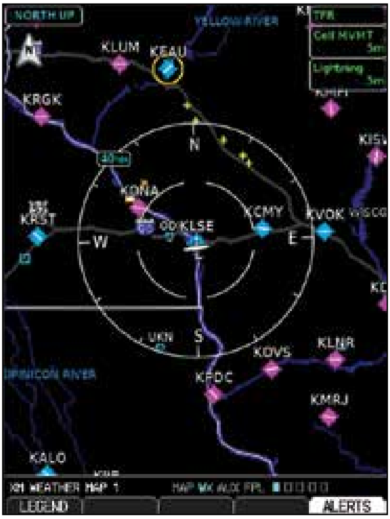

NORTH UP
YELLOW RIVER
TFR
Cell MVMT 5m
Lightning 5m
KLUM
KEAU
KRGK
KONA
KRST
KLSE
KCMY
KVOK
N
W
E
S
UKN
KOVS
KLNR
KFDC
KMRJ
KALO
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ALERTS

Figure 4-45 XM Weather - Lightning

Lightning Data Viewing Range

The Lightning Data Viewing Range option allows you to select the map range where at and below that value Lightning weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Lightning will not be shown. Where a value (such as 100 NM) is selected, NEXRAD data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the Lightning Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.8.13 XM SIGMETs and AIRMETs

SIGMETs (SIGnificant METeorological Information) and AIRMETs (AIRmen's METeorological Information) are broadcast for potentially hazardous weather considered of importance to aircraft. A Convective SIGMET is issued for hazardous convective weather. A localized SIGMET is a significant weather condition occurring at a localized geographical position.

When enabled, SIGMET/AIRMETs advise the pilot of potentially hazardous weather to all aircraft. SIGMET/AIRMET data covers icing, turbulence, dust, and volcanic ash as issued by the National Weather Service. The update rate is every 12 minutes.

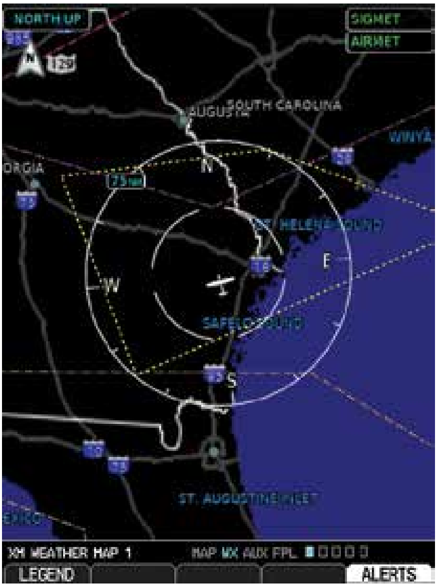

NORTH UP
SIGMET
AIRMET
AUGUSTA
SOUTH CAROLINA
WINYAH
GEORGIA
75nm
N
ST HELENA SOUND
E
W
SAFELO SOUND
S
ST. AUGUSTINE INLET
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ALERTS

Figure 4-46 XM Weather - AIRMETs (Graphic)

When enabled, the following AIRMETs are available for display:

- Icing
- Turbulence
- IFR conditions
- Mountain obscuration
- Surface winds

SIGMET/AIRMET Viewing Range

The SIGMET/AIRMET Viewing Range option allows you to select the map range where at and below that value SIGMET/AIRMET products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, SIGMET/AIRMET will not be shown. Where a value (such as 100 NM) is selected, SIGMET/AIRMET data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the SIG/AIR Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

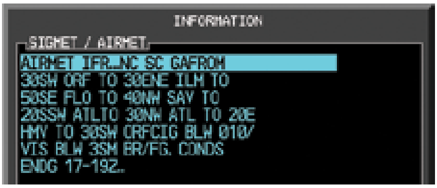
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

Viewing Textual Sigmet/Airmets

Textual Sigmet/Airmets can be viewed by selecting the Sigmet/Airmet outline on the Weather (WX) page.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a Sigmet/Airmet line. Press **ENT**.

2) The Sigmet/Airmet information will be shown. Press the small **MFD** knob to return to the previously viewed page.



```
AIRMET IFR...NC SC GAFROM
30SW ORF TO 30ENE ILM TO
50SE FLO TO 40NW SAY TO
20SSW ATLTO 30NW ATL TO 20E
HMY TO 30SW CRFCIG BLW 010/
VIS BLW 3SM BR/FG. CONDS
ENDG 17-19Z.
```

Figure 4-47 XM Weather - AIRMETs (Text)

4.8.14 XM PIREPs

Pilot Weather Reports (PIREPs) provide timely weather information for a particular route of flight. When significant weather conditions are reported or forecast, Air Traffic Control (ATC) facilities are required to solicit PIREPs. A PIREP may contain non-forecast adverse weather conditions, such as low in-flight visibility, icing conditions, wind shear, and turbulence. PIREPs are issued as either Routine (UA) or Urgent (UUA).

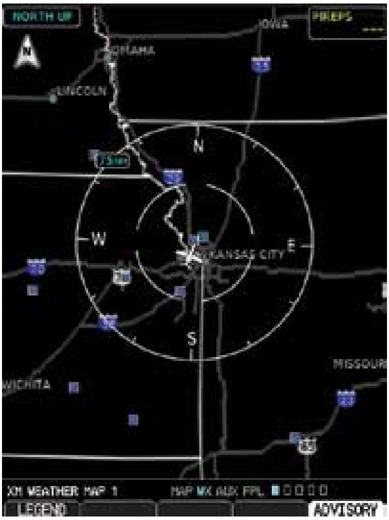


Figure 4-48 XM Weather PIREPs

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the PIREPs value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.8.15 XM METARs

***NOTE:** Atmospheric pressure reported for METARs is given in hectopascals (hPa), except in the United States, where it is reported in inches of mercury (in Hg). Temperatures are reported in Celsius.*

***NOTE:** METAR information is only displayed within the installed aviation database service area.*

METAR (METeorological Aerodrome Report), known as an Aviation Routine Weather Report, is the standard format for current weather observations. METARs are updated hourly and are considered current. METARs typically contain information about the temperature, dew point, wind, precipitation, cloud cover, cloud heights, visibility, and barometric pressure. They can also contain information on precipitation amounts, lightning, and other critical data. METARs are shown as colored flags at airports that provide them.

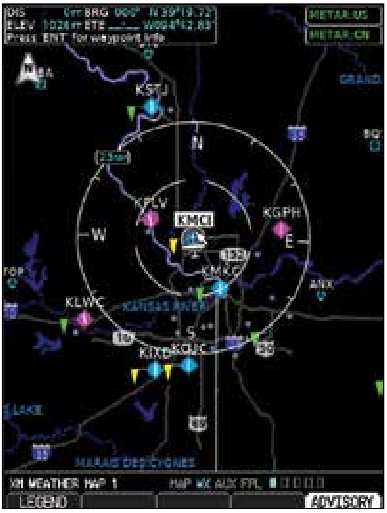


Figure 4-49 XM Weather - Graphic METARs

METAR Viewing Range

The METAR Viewing Range option allows you to select the map range where at and below that value METAR weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, METARs will not be shown. Where a value (such as 150 NM) is selected, METAR data will be shown at map ranges of the selected value (150 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the METAR Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

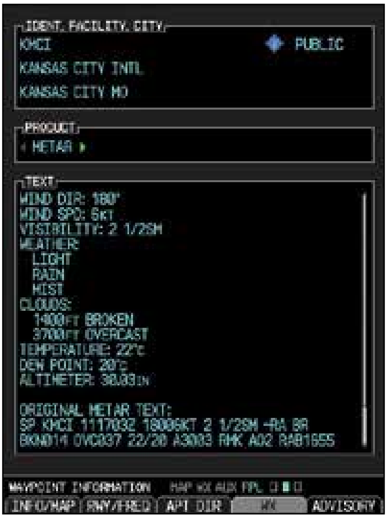
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

Viewing Textual METARs

Textual METARs can be viewed by selecting an airport on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight an airport with a METAR flag. Press **ENT**.

2) The Waypoint Information page for that airport will now be shown. Press the **WX** soft key to view weather information for the waypoint.



KMCI
PUBLIC
KANSAS CITY INTL
KANSAS CITY MO

METAR

```
WIND DIR: 180°
WIND SPD: 6KT
VISIBILITY: 2 1/2SM
WEATHER:
  LIGHT
  RAIN
  MIST
CLOUDS:
  1400FT BROKEN
  3700FT OVERCAST
TEMPERATURE: 22°C
DEW POINT: 20°C
ALTIMETER: 30.03IN

ORIGINAL METAR TEXT:
SP KMCI 111703Z 18006KT 2 1/2SM -RA BR
BKN014 OVC037 22/20 A3003 RMK AO2 RAB1655
```

Figure 4-50 XM Weather - Textual METARs

3) Use the small **MFD** knob or the large **MFD** knob to scroll through the available information.

4) Press the small **MFD** knob to return to the previously viewed page.

4.8.16 XM Winds Aloft

The Winds Aloft Altitude option allows you to select the altitude where at and below that value Winds Aloft weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). Altitude can be selected in 3000 foot increments from the surface up to 42,000 feet MSL. "ALT UNAVBL" is displayed when the altitude is unsupported for a specific product and will never show data on the map.

Pressing the **WX Alt Dn** or **WX Alt Up** soft keys steps down or up in the 3,000 foot increments. In the figure below where 9000 feet is selected, Winds Aloft data will be shown at 9000 feet.

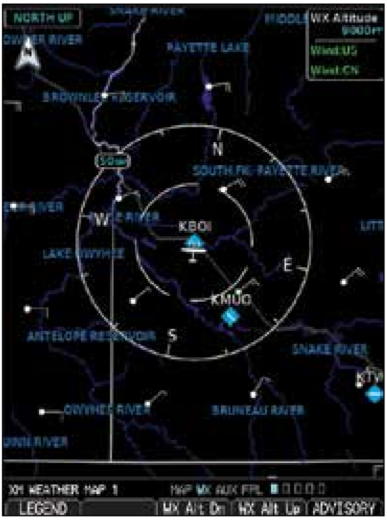
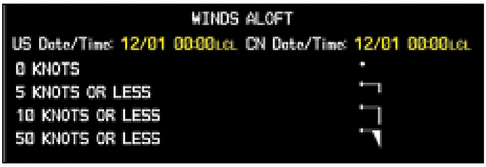

NORTH UP
WX Altitude
9000FT
Wind:US
Wind:CN
FAYETTE LAKE
BROWNLEE RESERVOIR
N
SOUTH FK PAYETTE RIVER
W
KBOI
LAKE OWYHEE
E
KMUO
ANTELOPE RESERVOIR
S
SNAKE RIVER
OWYHEE RIVER
BRUNEAU RIVER
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
WX Alt Dn
WX Alt Up
ADVISORY

Figure 4-51 XM Weather - Winds Aloft


WINDS ALOFT

US Date/Time: 12/01 00:00LCL CN Date/Time: 12/01 00:00LCL

0 KNOTS

5 KNOTS OR LESS

10 KNOTS OR LESS

50 KNOTS OR LESS

Figure 4-52 XM Weather - Winds Aloft Legend

Winds Aloft Data Viewing Range

The Winds Aloft Data Viewing Range option allows you to select the map range where at and below that value Winds Aloft weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Winds Aloft will not be shown. Where a value (such as 100 NM) is selected, Winds Aloft data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the Winds Aloft Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4.8.17 XM Surface Analysis and City Forecast

***NOTE:** Surface Analysis and City Forecast data are displayed only within the installed Aviation Database service area.*

Surface Analysis and City Forecast information is available for current and forecast weather conditions. Forecasts are available for intervals of 12, 24, 36, and 48 hours by pressing the **SRFC TIME** soft key or in the Page Menu Weather Setup options.

When enabled, the Surface Analysis forecast shows frontal lines indicating weather fronts and the direction they are moving. High and Low pressure centers are noted with a large H or L. The Forecast Time menu item will step through the intervals manually.

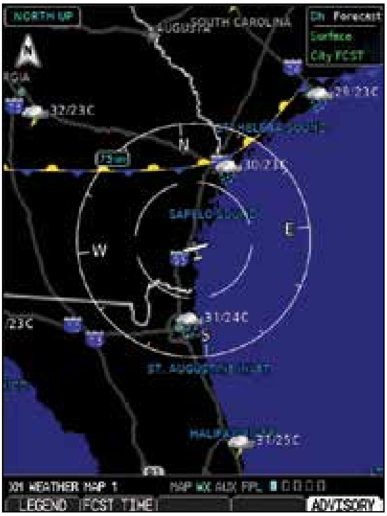

NORTH UP
AUGUSTA
SOUTH CAROLINA
On Forecast
Surface
City FCST
32/23C
29/23C
N
30/23C
SAPELO SOUND
E
W
23C
31/24C
S
ST. AUGUSTINE INLET
31/25C
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
FCST TIME
ADVISORY

Figure 4-53 XM Weather - Surface Analysis and City Forecast

A Cold Front is a front where cold air replaces warm air. A blue line with blue triangles that point in the direction of the cold air flow.

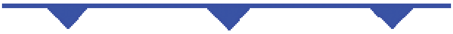


Figure 4-54 XM Weather - Cold Front

A Warm Front is where warm air replaces cold air. An orange line with orange half moons that point in the direction of the warm air flow.

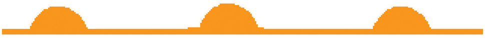


Figure 4-55 XM Weather - Warm Front

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

A Stationary Front is a front with very little horizontal movement. The line alternates with orange and blue sections which point in opposite directions to symbolize little movement.

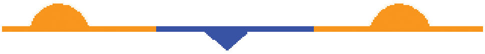


Figure 4-56 XM Weather - Stationary Front

An Occluded Front is where a cold front has overtaken and merged with a warm front. The line alternates with the blue triangle and orange half moon symbols on the same side of the line pointing in the direction the front is moving.

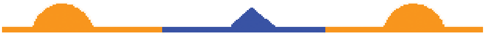


Figure 4-57 XM Weather - Occluded Front

Surface Data Viewing Range

The Surface Data Viewing Range option allows you to select the map range where at and below that value Surface Data weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Surface Data will not be shown. Where a value (such as 150 NM) is selected, Surface data will be shown at map ranges of the selected value (150 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the Surface Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

Forecast Time

The Forecast Time option allows you to select the forecast time when the Surface and City Forecast weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). Forecasts are available for intervals of current, 12, 24, 36, and 48 hours. The interval is selected by pressing the **FCST TIME** soft key on the Wx Data Link Map page.

4.8.18 XM County Warnings

County data provides specific public awareness and protection weather warnings from the National Weather Service (NWS). This can include information on fires, tornadoes, severe thunderstorms, flood conditions, and other natural disasters.

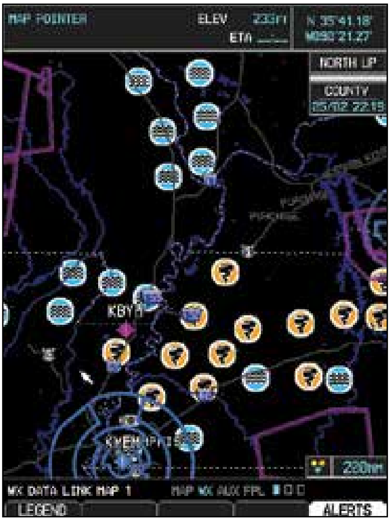


Figure 4-58 XM Weather - County Warnings

County Data Viewing Range

The County Data Viewing Range option allows you to select the map range where at and below that value County weather products will be shown on the selected MFD Wx Data Link Map pages (1, 2, or 3). When Off is selected, County Data will not be shown. Where a value (such as 100 NM) is selected, County data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the County Data Viewing Range value.

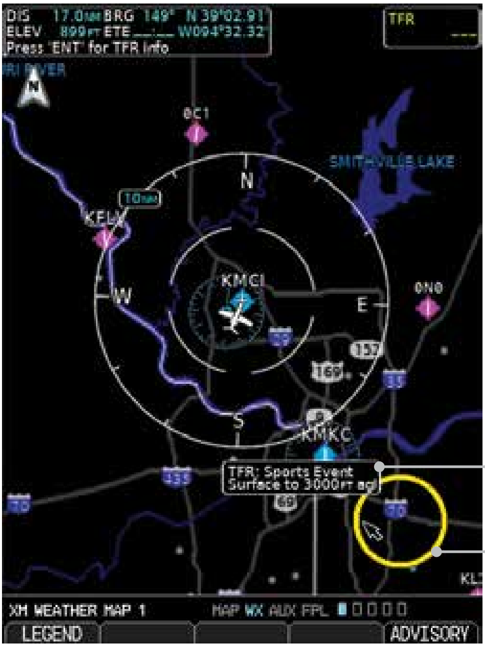
2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.8.19 XM TFRs

Temporary Flight Restrictions (TFRs) provide detailed information for local short term restrictions. The update rate is approximately every 20 minutes.



DIS 17.0NM BRG 149° N 39°02.91'
ELEV 899FT ETE __:__ W094°32.32'
Press 'ENT' for TFR info

TFR: Sports Event
Surface to 3000FT agl

TFR Detail

Select TFR Symbol To View Details

Figure 4-59 XM Weather - TFRs

The Temporary Flight Restriction (TFR) viewing range option selects whether TFR information is shown on the GFDS Weather Map. TFR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. For the value (such as 500 NM) selected, TFR information will be shown at map ranges of that value (500 NM), and lower.

1) While viewing Weather Setup 1/2 menu, turn the large **MFD** knob to highlight the TFR Data Viewing Range option.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

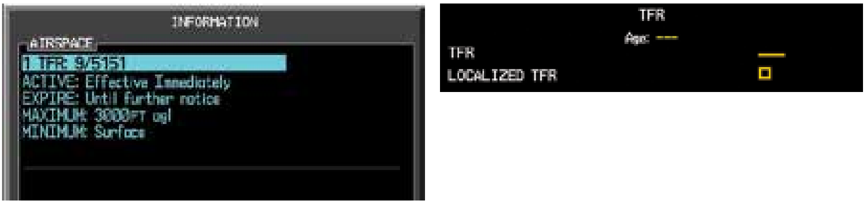
Viewing Textual TFRs

Textual TFRs can be viewed by selecting a TFR outline on the Weather (WX) pages.

1) While viewing a XM Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a TFR symbol (yellow circle). Press **ENT**.

2) The TFR details will be shown.

3) Press the small **MFD** knob or ENT to return to the Weather page.



INFORMATION

AIRSPACE

1 TFR: 9/5151
ACTIVE: Effective Immediately
EXPIRE: Until further notice
MAXIMUM: 3000FT agl
MINIMUM: Surface

TFR

Age: ---

TFR —

LOCALIZED TFR □

Figure 4-60 XM Weather - Textual TFRs and Legend

4.8.20 XM Cell Movement

Cell Movement data shows the location and movement of storm cells as identified by a ground-based system. Cells are represented by yellow squares, with direction of movement indicated with short, orange arrows.

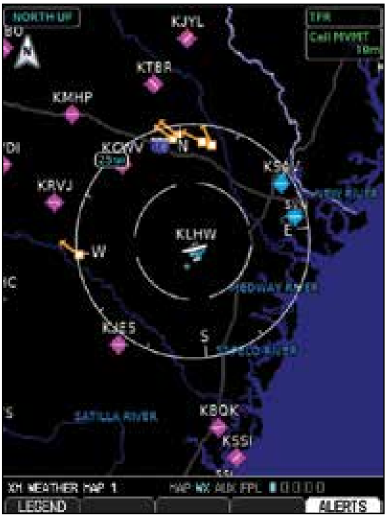


Figure 4-61 XM Weather - Cell Movement

On most applicable maps, Cell Movement data is selected for display along with NEXRAD. On the Weather Data Link Page, Cell Movement data can be selected independently.

Cell Movement Data Viewing Range

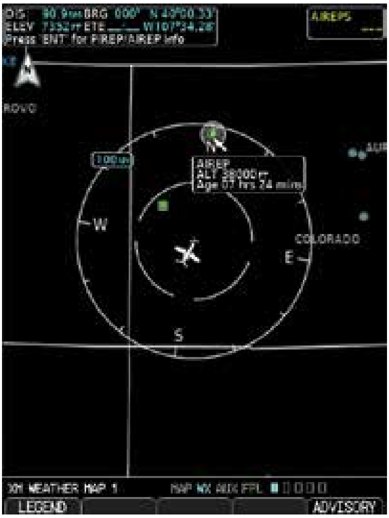
The Cell Movement Data Viewing Range option allows you to select the map range and below where Cell Movement weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Cell Movement will not be shown. Where a value (such as 100 NM) is selected, Cell Movement data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the Cell Movement Data Viewing Range option.
2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4.8.21 XM AIREPs

Air Reports (AIREPs) are messages from an aircraft, typically from commercia aircraft, to a ground station. AIREPs are similar to PIREPs.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the AIREPs Viewing Range option.
2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.



DIS 90.9nm BRG 000° N 40°00.33'
ELEV 7332ft ETE ___ W107°34.28'
Press ENT for PIREP/AIREP info

AIREP
ALT 38000ft
Age 07 hrs 24 mins

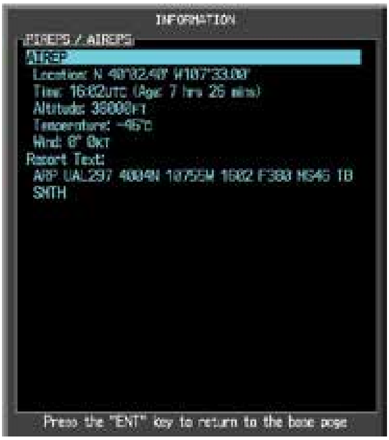
Figure 4-62 XM Weather - AIREPs

Viewing Textual AIREPs/PIREPs

Textual AIREPs/PIREPs can be viewed by selecting a AIREP on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight an airport with a AIREP.

2) Press **ENT** to view text information. Press **ENT** again to return to the previous page.



INFORMATION

PIREPS / AIREPS

AIREP
Location: N 40°02.40' W107°33.00'
Time: 16:02UTC (Age: 7 hrs 26 mins)
Altitude: 38000FT
Temperature: -45°C
Wind: 0° 0KT
Report Text:
ARP UAL297 4004N 10755W 1602 F380 MS45 TB SMTH

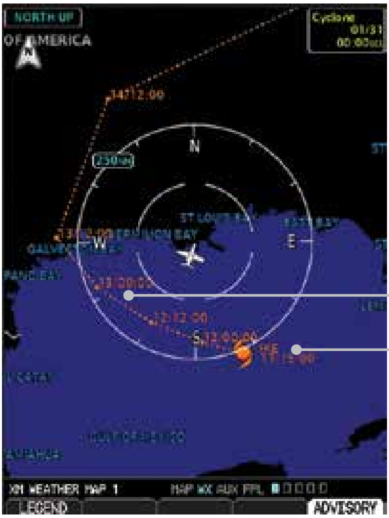
Press the "ENT" key to return to the base page

Figure 4-63 XM Weather - AIREP Text Detail

4.8.22 XM Cyclone

The current location of the cyclone is shown along with its projected path with the date and time.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the Cyclone Data Viewing Range option.
2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.


NORTH UP
OF AMERICA
Cyclone
01/31
00:00
14/12:00
250nm
N
E
S
W
GALVESTON
XM WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

Projected Path With Date And Time

Current Position Of Cyclone

Figure 4-64 XM Weather - Cyclone

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.8.23 XM Freezing Level

Freezing Level data shows the color-coded contour lines for the altitude and location at which the Freezing Level is found. When no data is displayed for a given altitude, the data for that altitude has not been received, or is out of date and has been removed from the display. New data appears at the next update.

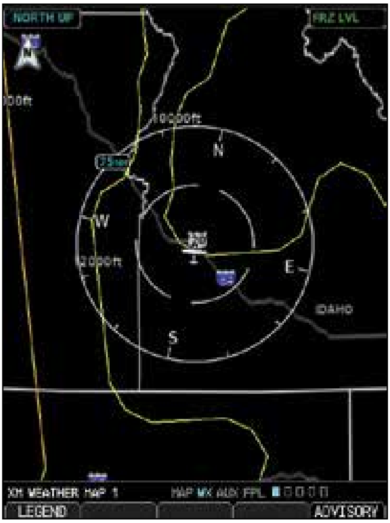


Figure 4-65 XM Weather - Freezing Levels

Freezing Level Viewing Range

The Freezing Level Viewing Range option allows you to select the map range where at and below that value Freezing Level weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Freezing Level Data will not be shown. Where a value (such as 100 NM) is selected, Freezing Level data will be shown at map ranges of the selected value (100 NM) and lower.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the Frz Lvl Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4.8.24 XM Icing

The Icing product shows a graphic view of the current icing environment in four categories: light, moderate, severe, and extreme (not specific to aircraft type). The Icing product is not a forecast, but a presentation of the current conditions at the time of the analysis. Supercooled Large Droplet (SLD) icing conditions are characterized by the presence of relatively large, super cooled water droplets indicative of freezing drizzle and freezing rain aloft. SLD threat areas are depicted as black and red blocks over the Icing colors. Icing and SLD data are shown between 1,000 feet and 30,000 feet in 3,000 foot increments.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the Icing Data Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

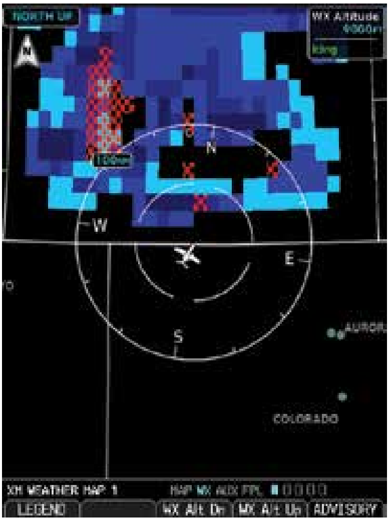


Figure 4-66 XM Weather - Icing and SLD

4) Press the **WX Alt Dn** or **WX Alt Up** keys to increase or decrease the reporting altitude of icing in 3,000 foot increments. The selected altitude is shown in a window above the altitude keys.

4.8.25 XM Turbulence

Turbulence data identifies the potential for erratic movement of high-altitude air mass associated winds. Turbulence is classified as light, moderate, severe or extreme, at altitudes between 21,000 and 45,000 feet. Turbulence data is intended to supplement AIRMETs and SIGMETs.

1) While viewing Weather Setup 2/2 menu, turn the large **MFD** knob to highlight the Turbulence Viewing Range value.

2) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

3) Press the small **MFD** knob to cancel selection or to end editing and return to the previously viewed page or turn the large **MFD** knob to the next option.

4) Press the **WX Alt Dn** or **WX Alt Up** keys to increase or decrease the reporting altitude of icing in 3,000 foot increments. The selected altitude is shown in a window above the altitude keys.

4.9 Weather Radar

The G500/600 can display weather radar from a Garmin GWX system or from selected 3rd-party radars. Only one weather radar system may be interfaced to the system. For detailed information on the operation of 3rd-party radars, refer to their specific documentation.

4.9.1 Garmin GWX 68 Radar Description

The Garmin GWX 68 and GWX 70 Airborne Color Weather Radars combine excellent range and adjustable scanning profiles with a high-definition target display.

To focus radar scanning on specific areas, Sector Scanning offers pilot-adjustable horizontal scan angles of 20º, 40º, 60º, or 90º (up to 120º with the GWX 70). A vertical scanning function helps to analyze storm tops, gradients, and cell buildup activity at various altitudes.

See the documentation of each radar for specific features.

4.9.1.1 Principles of Pulsed Airborne Weather Radar

The term RADAR is an acronym for RAdio Detecting and Ranging. Pulsed radar locates targets by transmitting a microwave pulse beam that, upon encountering a target, is then reflected back to the radar receiver as a return "echo." The microwave pulses are focused and radiated by the antenna, with the most intense energy in the center of the beam and decreasing intensity near the edge. The same antenna is used for both transmitting and receiving. The returned signal is then processed and displayed on the G500/600 MFD.

Radar detection is a two-way process that requires 12.36 micro-seconds for the transmitted microwave pulses to travel out and back for each nautical mile of target range. It takes 123.6 micro-seconds for a transmitted pulse to make the round trip if a target is 10 NM away.

The GWX weather radar should be used to avoid severe weather, not for penetrating severe weather. The decision to fly into an area of radar targets depends on target intensity, spacing between the targets, aircraft capabilities and pilot experience. Pulse type weather radar detects only precipitation, not clouds or turbulence. The display may indicate clear areas between intense returns, but this does not necessarily mean it is safe to fly between them. Only Doppler radar can detect turbulence.

Airborne weather radar has other capabilities beyond weather detection. It also has the ability to detect and provide distance to objects on the ground, such as, cities, mountains, coastlines, rivers, lakes, and oceans.

4.9.1.2 Antenna Beam Illumination

It is important to understand the concept of the antenna beam illumination. The radar beam is much like the beam of a spotlight. The farther the beam travels, the wider it gets. The radar is only capable of "seeing" what is inside the boundaries of the beam.

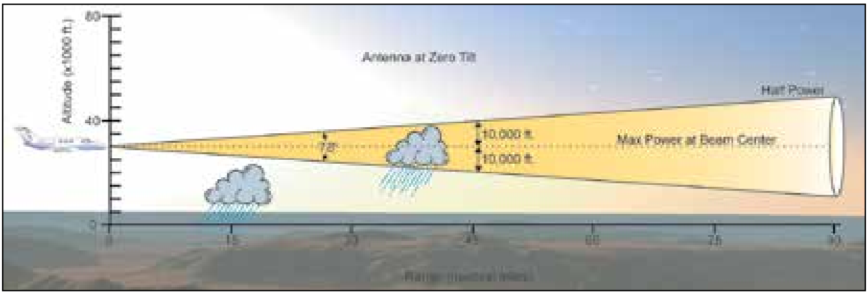

Altitude (x1000 ft.)
60
40
0
Antenna at Zero Tilt
Half Power
7.8°
10,000 ft
10,000 ft
Max Power at Beam Center
0
15
45
60
75
90
Range (nautical miles)

Figure 4-67 Radar Beam from 12 inch Antenna

The vertical dimensions of the radar beam are shown in the figure above and the same holds true for the horizontal dimensions. In other words, the beam will be as wide as it is tall. Note that it is possible not to see areas of precipitation on the radar display because of the antenna tilt setting. With the antenna tilt set to zero in this illustration, the beam overshoots the precipitation at 15 NM. The curvature of the earth can also be a factor, especially at range settings of 150 NM or more.

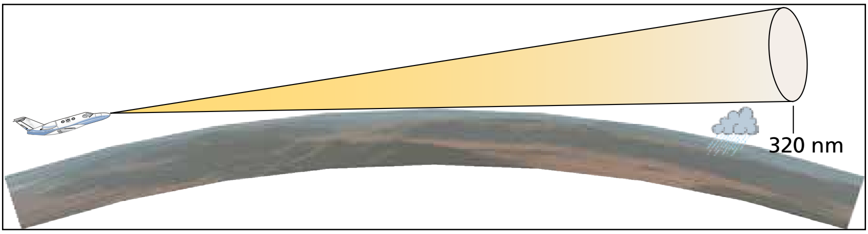


Figure 4-68 Radar Beam in Relation to the Curvature of the Earth

4.9.1.3 Radar Signal Attenuation

The phenomena of weather attenuation needs to be kept in mind whenever operating the weather radar. When the radar signal is transmitted, it is progressively absorbed and scattered, making the signal weaker. This weakening, or attenuation, is caused by two primary sources, distance and precipitation.

Attenuation because of distance is due to the fact that the amount of radar energy at a distance from the antenna is inversely proportional to the square of the distance. The reflected radar energy from a target 40 miles away that fills the radar beam will be one fourth the energy reflected from an equivalent target 20 miles away. This would appear to the operator that the storm is gaining intensity as the aircraft gets closer. Internal circuitry within the GWX system compensates for much of this distance attenuation.

Attenuation due to precipitation is not as predictable as distance attenuation. It is also more intense. As the radar signal passes through moisture, a portion of the radar energy is reflected back to the antenna. However, much of the energy is absorbed. If precipitation is very heavy, or covers a large area, the signal may not reach completely through the area of precipitation. The weather radar system cannot distinguish between an attenuated signal and area of no precipitation. If the signal has been fully attenuated, the radar will display a “radar shadow.” This appears as an end to the precipitation when, in fact, the heavy rain may extend much further. A cell containing heavy precipitation may block another cell located behind the first, preventing it from being displayed on the radar. Never fly into these shadowed areas and never assume that all of the heavy precipitation is being displayed unless another cell or a ground target can be seen beyond the heavy cell. The WATCH™ feature of the GWX Weather Radar system can help in identifying these shadowed areas. Areas in question will appear as “shadowed” or gray area on the radar display. Proper use of the antenna tilt control can also help detect radar shadows.

Attenuation can also be due to poor maintenance or degradation of the radome. Even the smallest amount of wear and tear, pitting, and pinholes on the radome surface can cause damage and system inefficiency.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.9.2 Radar Signal Reflectivity

4.9.2.1 Precipitation

Precipitation or objects more dense than water, such as earth or solid structures, will be detected by the weather radar. The weather radar will not detect clouds, thunderstorms or turbulence directly. It detects precipitation associated with clouds, thunderstorms, and turbulence. The best radar signal reflectors are raindrops, wet snow or wet hail. The larger the raindrop the better it reflects. The size of the precipitation droplet is the most important factor in radar reflectivity. Because large drops in a small concentrated area are characteristic of a severe thunderstorm, the radar displays the storm as a strong return. Ice, dry snow, and dry hail have low reflective levels and often will not be displayed by the radar. A cloud that contains only small raindrops, such as fog or drizzle, will not reflect enough radar energy to produce a measurable target return.

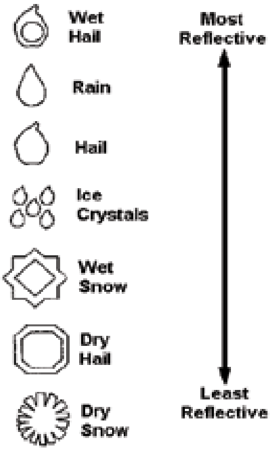


Figure 4-69 Precipitation Type and Reflectivity

4.9.2.2 Ground Returns

The intensity of ground target returns depends upon the angle at which the radar beam strikes the ground target (Angle of Incidence) and the reflective properties of that target. The gain can be adjusted so shorelines, rivers, lakes, and cities are well defined. Increasing gain too much causes the display to fill in between targets, thus obscuring some landmarks.

Cities normally provide a strong return signal. While large buildings and structures provide good returns, small buildings can be shadowed from the radar beam by the taller buildings. As the aircraft approaches, and shorter ranges are selected, details become more noticeable as the highly reflective regular lines and edges of the city become more defined.

Bodies of water such as lakes, rivers, and oceans are not good reflectors, and normally do not provide good returns. The energy is reflected in a forward scatter angle with inadequate energy being returned. They can appear as dark areas on the display. However, rough or choppy water is a better reflector and will provide stronger returns from the downwind sides of the waves.

Mountains also provide strong return signals to the antenna, but also block the areas behind. However, over mountainous terrain, the radar beam can be reflected back and forth in the mountain passes or off canyon walls using up all or most of the radar energy. **In this case, no return signal is received from this area causing the display to show a dark spot which could indicate a pass where no pass exists.**

4.9.2.3 Angle of Incidence

The angle at which the radar beam strikes the target is called the Angle of Incidence. Incident angle (“A”) is illustrated below. This directly affects the detectable range, the area of illumination, and the intensity of the displayed target returns. A large incident angle gives the radar system a smaller detectable range and lower display intensity due to minimized reflection of the radar energy.

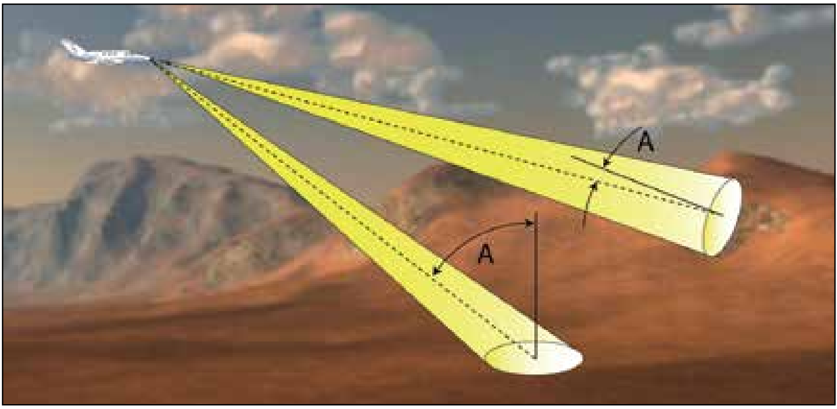


Figure 4-70 Angle of Incidence

A smaller incident angle gives the radar a larger detectable range of operation and the target display will show a higher intensity. Since more radar energy is reflected back to the antenna with a low incident angle, the resulting detectable range is increased for mountainous terrain.

4.9.3 Operating Distance

The following information establishes a minimum safe distance from the antenna for personnel near an operating airborne weather radar. The minimum safe distance is based upon the FCC's exposure limit at 9.3 to 9.5 GHz for general population/uncontrolled environments which is 1 mW/cm^2. See Advisory Circular 20-68B for more information on safe distance determination.

4.9.3.1 Maximum Permissible Exposure Level (MPEL) (GWX 68)

The zone in which the radiation level exceeds the US Government standard of 1 mW/cm^2, is the semicircular area of at least 11 feet from the 12 inch antenna as indicated in the illustration below. All personnel must remain outside of this zone. With a scanning or rotating beam, the averaged power density at the MPEL boundary is significantly reduced.

4.9.3.2 Maximum Permissible Exposure Level (MPEL) (Other Radars)

See the appropriate documentation for MPEL.

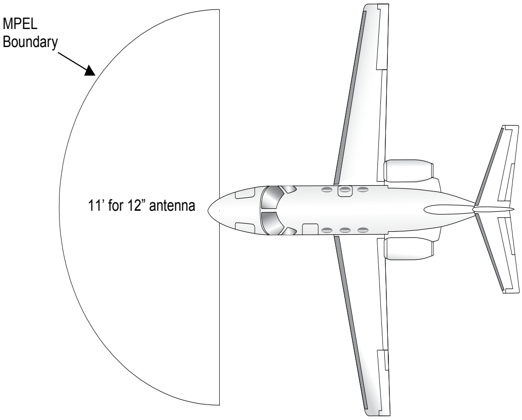


Figure 4-71 MPEL Boundary

4.9.4 Basic Antenna Tilt Setup

The following discussion is a simple method for setting up the weather radar antenna tilt for most situations. It is not to be considered an all encompassing setup that will work in all situations, but this method does provide good overall parameters for the monitoring of threats. Ultimately, it is desired to have the antenna tilted so that the bottom of the radar beam is four degrees below parallel with the ground. The following discussion explains one way of achieving this.

With the aircraft flying level, adjust the antenna tilt so ground returns are displayed at a distance that equals the aircraft's current altitude (AGL) divided by 1,000. For example, if the aircraft is at 14,000 feet, adjust the tilt so the front edge of ground returns are displayed at 14 NM. Note this antenna tilt angle setting. Now, raise the antenna tilt 6° above this setting. The bottom of the radar beam is now angled down 4° from parallel with the ground.

Practical Application Using the Basic Tilt Setup

At this point, when flying at altitudes between 2,000 and 30,000 feet AGL, any displayed target return should scrutinized. If the displayed target advances on the screen to 5 NM of the aircraft, avoid it. This may be either weather or ground returns that are 2,000 feet or less below the aircraft. Raising the antenna tilt 4° can help separate ground returns from weather returns in relatively flat terrain. This will place the bottom of the radar beam level with the ground. Return the antenna tilt to the previous setting after a few sweeps.

If the aircraft is above 29,000 feet, be cautious of any target return that gets to 30 NM or closer. This is likely a thunderstorm that has a top high enough that the aircraft cannot fly over it safely.

If the aircraft altitude is 15,000 feet or lower, set the displayed range to 60 NM. Closely monitor anything that enters the display.

Also, after setting up the antenna tilt angle as described previously, ground returns can be monitored for possible threats. The relationship between antenna tilt angle, altitude, and distance is one degree of tilt equals 100 feet of altitude for every one nautical mile.

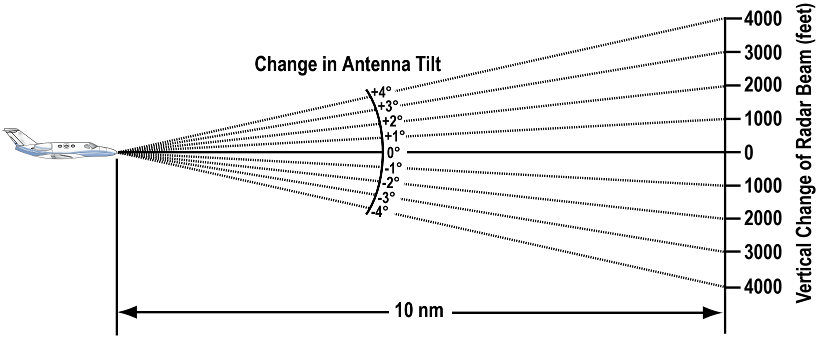


Figure 4-72 Vertical Change in Radar Beam per Nautical Mile

Therefore, with the antenna tilt set so that the bottom of the beam is four degrees below parallel with the ground, a target return at 10 NM is approximately 4,000 feet below the aircraft; at 20 NM, 8,000 feet; at 50 NM, 20,000 feet. In other words, at this tilt setting, a ground return (such as a mountain peak) being displayed at 10 NM would have a maximum distance below the aircraft of 4,000 feet. If that ground target return moves to 5 NM, maximum distance below the aircraft will be 2,000 feet.

This setup will provide a good starting point for practical use of the GWX radar. There are many other factors to consider in order to become proficient at using weather radar in all situations.

4.9.5 Weather Mapping and Interpretation

4.9.5.1 Weather display Interpretation

When evaluating various target returns on the weather radar display, the colors denote approximate rainfall intensity and rates as shown in the table below.

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

Weather Mode Color	GWX 68 Radars		GWX 70 Radars	3rd Party Radars
	Approximate Intensity	Approximate Rainfall Rate (in/hr)	Approximate Intensity	Radar Return Level (see radar documentation for details)
BLACK	< 23 dBZ	< .01	< 23 dBZ	0
GREEN	23 dBZ to < 33 dBZ	.01 - 0.1	23 dBZ to < 33 dBZ	1
YELLOW	33 dBZ to < 41 dBZ	0.1 - 0.5	33 dBZ to < 41 dBZ	2
RED	41 dBZ to < 50 dBZ	0.5 - 2	41 dBZ to < 50 dBZ	3
MAGENTA	50 dBZ and greater	> 2	50 dBZ and greater	4
WHITE			Turbulence Detection	

Table 4-25 Precipitation Intensity Levels

4.9.5.2 Thunderstorms

Updrafts and downdrafts in thunderstorms carry water through the cloud. The more severe the drafts, the greater the number and size of the precipitation droplets. With this in mind, the following interpretations can be made from what is displayed on the weather radar. Avoid these areas by an extra wide margin.

- In areas where the displayed target intensity is red or magenta (indicating large amounts of precipitation), the turbulence is considered severe.
- Areas that show steep color gradients (intense color changes) over thin bands or short distances suggest irregular rainfall rate and strong turbulence.
- Areas that show red or magenta are associated with hail or turbulence, as well as heavy precipitation. Vertical scanning and antenna tilt management may be necessary to identify areas of maximum intensity.

Along squall lines (multiple cells or clusters of cells in a line), individual cells may be in different stages of development. Areas between closely spaced, intense targets may contain developing clouds not having enough moisture to produce a return. However, these areas could have strong updrafts or downdrafts. Targets showing wide areas of green are generally precipitation without severe turbulence.

Irregularities in the target return may also indicate turbulence, appearing as “hooks,” “fingers,” or “scalloped” edges. These irregularities may be present in green areas with no yellow, red, or magenta areas and should be treated as highly dangerous areas. Avoid these areas as if they were red or magenta areas.

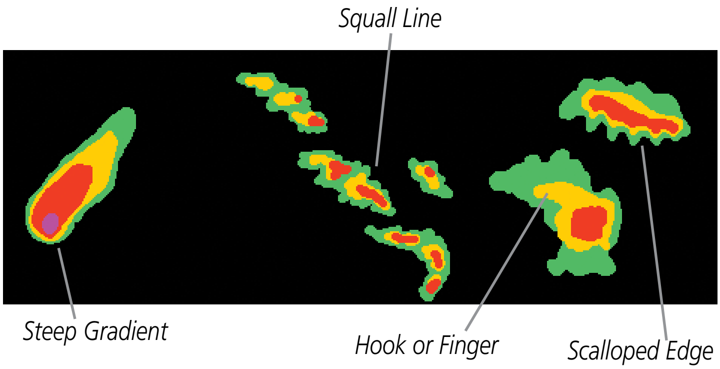


Figure 4-73 Cell Irregularities

Thunderstorm development is rapid. A course may become blocked within a short time. When displaying shorter ranges, periodically select a longer range to see if problems are developing further out. That can help prevent getting trapped in a “blind alley” or an area that is closed at one end by convective weather.

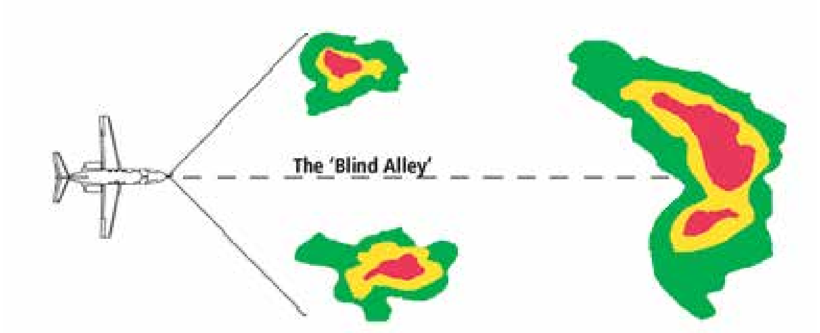


Figure 4-74 The “Blind Alley” Overhead View

In areas of multiple heavy cells, use the Vertical Scan feature along with antenna tilt management to examine the areas. Remember to avoid shadowed areas behind targets.

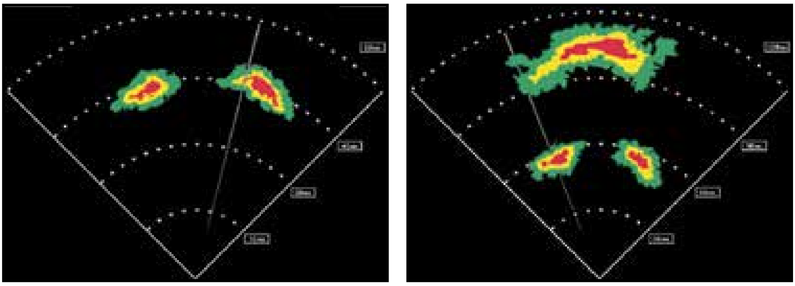


Figure 4-75 The “Blind Alley” Horizontal Scan

4.9.5.3 Tornadoes

There is no conclusive radar target return characteristics which will identify a tornado, however, tornadoes may be present if the following characteristics are observed:

- A narrow, finger-like portion, as shown on the previous page, extends and, in a short time, curls into a hook and closes on itself.
- A "hook" which may be in the general shape of the numeral "6," especially if bright and projecting from the southwest quadrant (northeast quadrant in the southern hemisphere) of a major thunderstorm.
- V- shaped notches.
- Doughnut shapes.

These shapes do not always indicate tornadoes, nor are tornado returns limited to these characteristics. Confirmed radar observations of tornadoes most often have not shown shapes different from those of a normal thunderstorm display.

4.9.5.4 Hail

Hail results from updrafts carrying water high enough to freeze. Therefore, the higher the top of a thunderstorm, the greater the probability that it contains hail. Vertically scanning the target return can give the radar top of a thunderstorm that contains hail. Radar top is the top of a storm cell *as detected by radar*. It is not the actual top, or true top of the storm. The actual top of a storm cell is seen with the eyes in clear air and may be much higher than the radar top. The actual top does not indicate the top of the hazardous area.

Hail can fall below the minimum reflectivity threshold for radar detection. It can have a film of water on its surface, making its reflective characteristics similar to a very large water droplet. Because of this film of water, and because hail stones usually are larger than water droplets, thunderstorms with large amounts of wet hail return stronger signals than those with rain. Some hail shafts are extremely narrow (100 yards or less) and make poor radar targets. In the upper regions of a cell where ice particles are "dry" (no liquid coating), target returns are less intense.

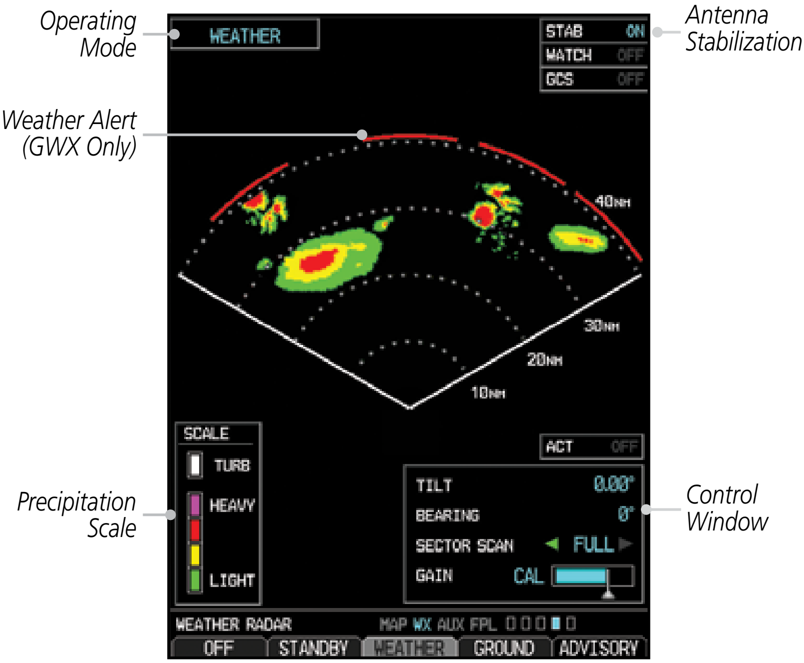
Hail shafts are associated with the same radar target return characteristics as tornados. U-shaped cloud edges 3 to 7 miles across can also indicate hail. These target returns appear quite suddenly along any edge of the cell outline. They also change in intensity and shape in a matter of seconds, making vigilant monitoring essential.

4.9.6 Radar Operation in Weather Mode

***WARNING:** Begin transmitting only when it is safe to do so. When transmitting while the aircraft is on the ground, no personnel or objects should be within 11 feet of the antenna.*

***CAUTION:** In Standby mode, the antenna is parked at the center line. It is always a good idea to put the radar in Standby mode before taxiing the aircraft to prevent the antenna from bouncing on the bottom stop and possibly causing damage to the radar assembly.*

When the weather radar system is in the Weather or Ground Map mode, the system automatically switches to Standby mode on landing.


Operating Mode
Weather Alert (GWX Only)
Precipitation Scale
Antenna Stabilization
Control Window
WEATHER
40NM
30NM
20NM
10NM
SCALE
TURB
HEAVY
LIGHT
WEATHER RADAR
MAP WX AUX FPL
OFF
STANDBY
WEATHER
GROUND
ADVISORY

STAB ON
WATCH OFF
GCS OFF
ACT OFF
TILT 0.00°
BEARING 0°
SECTOR SCAN ◀ FULL ▶
GAIN CAL

Figure 4-76 Horizontal Scan Display

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.9.6.1 Displaying Weather on the Weather Radar Page

***NOTE:** Distances on the Weather Radar page are always shown in NM.*

1) While viewing the Weather Radar page of the Wx page group, press the **MODE** soft key.
2) While on the ground, press the **STANDBY** soft key. A warm-up period is initiated (countdown is displayed on the screen - GWX radars only). After the warm-up is complete, the radar enters the Standby Mode.
3) When the aircraft is airborne, press the **WEATHER** soft key.

   OR
4) Select the **WEATHER** soft key. A confirmation window is displayed.

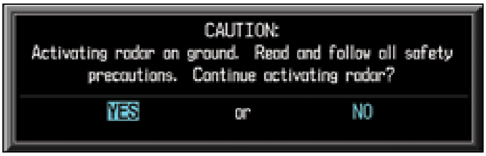
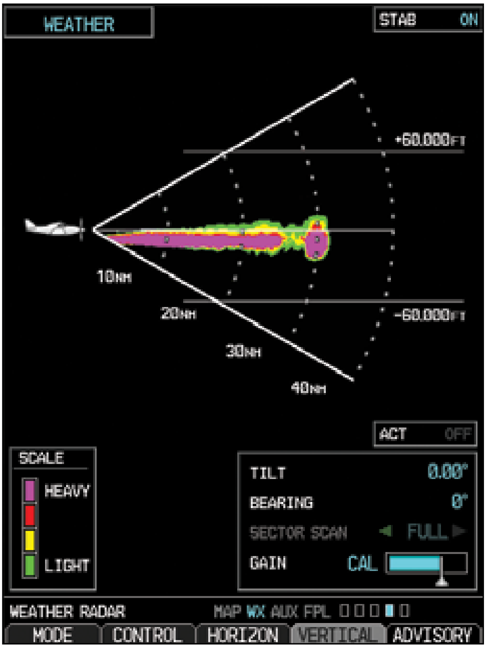

CAUTION:
Activating radar on ground. Read and follow all safety precautions. Continue activating radar?

Figure 4-77 Caution for Radar Activation Confirmation

5) Turn the large **MFD** Knob to highlight YES and press the **ENT** key to continue radar activation.

   OR
6) If the aircraft is airborne, select the **WEATHER** soft key. A warm-up period is initiated (countdown is displayed on the screen - GWX radars only). After the warm-up is complete, the radar begins transmitting.
7) Press the **RNG** keys to select the desired range.


WEATHER
+60,000FT
10NM
20NM
30NM
40NM
-60,000FT
SCALE
HEAVY
LIGHT
WEATHER RADAR
MAP WX AUX FPL
MODE
CONTROL
HORIZON
VERTICAL
ADVISORY

STAB ON
ACT OFF
TILT 0.00°
BEARING 0°
SECTOR SCAN ◄ FULL ►
GAIN CAL

Figure 4-78 Vertical Scan Display

4.9.6.2 Vertically Scanning a Storm Cell (Not available with all radars)

When vertically scanning with stabilization ON, the actual physical area that the radar is sweeping may not match the GDU vertical scan display. This occurs whenever the aircraft pitch is not at 0 degrees. To compensate for this, the GDU vertical display will "erase" the portion of the vertical display that is no longer being scanned. It will appear that the vertical sweep "wraps around" when reaching the end of the GDU vertical display. The radar is simply "erasing" the portion of the vertical display that is not currently being scanned.

***NOTE:** Vertical scanning of a storm cell should be done with the aircraft wings level to avoid constant adjustment of the Bearing Line.*

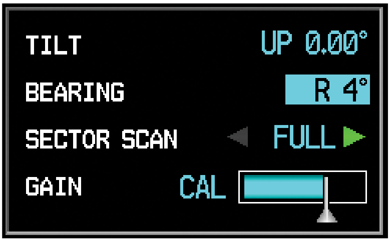
1) While in the Horizontal Scan view, press the **CONTROL** and then the **BRG** soft keys. This displays the Bearing Line.

   OR

   Press **MENU** and turn the large or small **MFD** knobs to highlight the "Show Bearing Line" menu item and press the **ENT** key. This displays the Bearing Line.

2) Press the **MFD** knob to activate the Bearing Line Adjustment in the Control window. Turn the Large **MFD** knob to highlight the Bearing value.

3) Turn the small **MFD** knob to place the Bearing Line on the desired storm cell or other area to be vertically scanned.



TILT UP 0.00°
BEARING R 4°
SECTOR SCAN ◀ FULL ▶
GAIN CAL

Figure 4-79 Bearing Line Adjustment

4) Press the **VERTICAL** soft key. A vertical "slice" of the selected area will now be displayed.

5) With the Bearing value still highlighted, the small **MFD** Knob may be used to move the scanned "slice" a few degrees right or left.

6) Press the **RNG** keys to adjust the range.

7) Press the **MFD** Knob to remove the cursor.

8) To select a new area to be vertically scanned, select the **HORIZON** soft key to return to the Horizontal Scan view and repeat the previous steps.

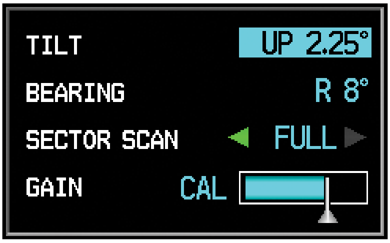
4.9.6.3 Adjusting the Antenna Tilt Angle

In order to make an accurate interpretation of a storm cell, the radar beam should be pointed at the wet part of the weather cell to record the proper rainfall intensity (color level). The ideal aiming point is just below the freezing level of the storm. The best way to find this point is to use the Vertical Scan feature. The antenna tilt angle can be centered on the strongest return area in the vertical scan to get a more accurate view of the coverage and intensity of the target in the horizontal scan.

Adjusting Antenna Tilt on the Horizontal Scan Display

1) Press the **MFD** knob.

2) With the Tilt value highlighted in the Control window, turn the small **MFD** knob to adjust the Tilt.



TILT UP 2.25°
BEARING R 8°
SECTOR SCAN ◄ FULL ►
GAIN CAL

Figure 4-80 Adjusting Tilt

Adjusting Antenna Tilt on the Vertical Scan Display (Not available with all radars)

1) While in the Vertical Scan view, press the **CONTROL** and then the **TILT** soft keys. This displays the Tilt Line.

   OR

   Press **MENU** and turn the large or small **MFD** knobs to highlight the "Show Tilt Line" menu item and press the **ENT** key. This displays the Tilt Line.

2) Press the **MFD** knob to activate the Tilt Adjustment in the Control window. Turn the large **MFD** knob to highlight the Tilt value.

3) Turn the small **MFD** knob to adjust the Tilt value.

4.9.6.4 Adjusting Gain

The gain is used to adjust the sensitivity of the radar receiver. It can be used to adjust the characteristics of the returns.

Gain adjustment is shown in the Gain bar graph. The white reference line on the right side of the bar graph indicates the calibration reference point.

***WARNING**: Changing the gain in weather mode will cause precipitation intensity to be displayed as a color not representative of the true intensity. Remember to return the gain setting to: "Calibrated" for viewing the actual intensity of precipitation.*

***NOTE:** Gain can be adjusted in Weather mode on the GWX radars only.*

1) While viewing the Weather Radar page of the Wx page group, press the **MENU** key.

2) Turn the large **MFD** knob to highlight "Manual Gain" and press **ENT**. This will highlight the Gain value in the Control window.

3) Turn the small **MFD** knob to adjust the Gain.

OR

1) Press the **MFD** knob and turn the large **MFD** knob to highlight the Gain value in the Control window.

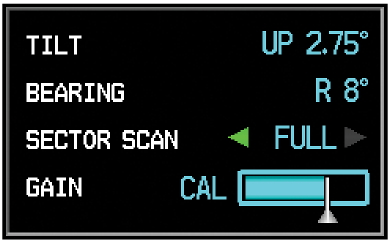


Figure 4-81 Highlight Gain Cal Value

2) Turn the small **MFD** knob to adjust the Gain Cal value. Press the **MFD** knob again to accept the value and end editing.

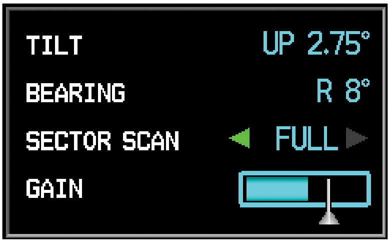
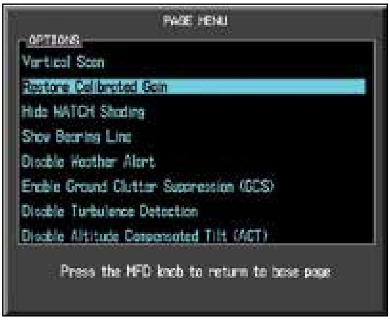


Figure 4-82 Adjust Gain Cal Value

Restore Calibrated Gain

1) While viewing the Weather Radar page of the Wx page group, press the **MENU** key.

2) Turn the large **MFD** knob to highlight "Restore Calibrated Gain" and press **ENT**.


PAGE MENU
OPTIONS
Vertical Scan
Restore Calibrated Gain
Hide WATCH Shading
Show Bearing Line
Disable Weather Alert
Enable Ground Clutter Suppression (GCS)
Disable Turbulence Detection
Disable Altitude Compensated Tilt (ACT)

Press the MFD knob to return to base page

Figure 4-83 Restore Calibrated Gain

OR

1) While viewing the Weather Radar page of the Wx page group, press the **CONTROL** soft key.

2) Press the **GAIN CAL** soft key to restore the calibrated gain value. Press the **MFD** knob again to accept the value and end editing.

4.9.6.5 Sector Scan (GWX Radars Only)

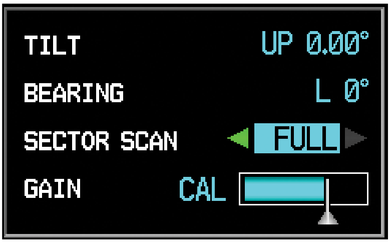
Adjusting the Sector Scan reduces the scan angle from Full in increments of ±20°, ±40°, and ±60° in horizontal scanning. Sector scanning is not available for vertical scanning.

1) While viewing the Weather Radar page of the Wx page group, press the **CONTROL** soft key.

2) Press the **BRG** soft key to display the Bearing Line.

3) Turn the small **MFD** knob to place the Bearing Line in the desired position. The location of the Bearing Line will become the center point of the Sector Scan.

4) Turn the large **MFD** knob to place the cursor in the SECTOR SCAN field.

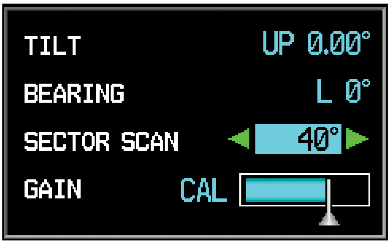


TILT UP 0.00°
BEARING L 0°
SECTOR SCAN FULL
GAIN CAL

Figure 4-84 Sector Scan - Full

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

5) Turn the small **MFD** knob to select FULL, 60°, 40°, or 20° scan.



TILT UP 0.00°
BEARING L 0°
SECTOR SCAN 40°
GAIN CAL

Figure 4-85 Sector Scan - 40°

6) If desired, readjust the Bearing Line as discussed previously to change the center of the Sector Scan.

7) Remove Sector Scanning by returning the SECTOR SCAN value to FULL.

4.9.6.6 Antenna Stabilization

1) While viewing the Weather Radar page of the Wx page group, press the **CONTROL** soft key.

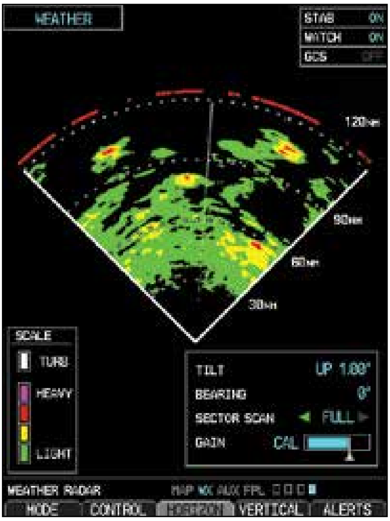
2) To activate or deactivate the antenna stabilization, press the **STAB ON** soft key to activate antenna stabilization or press the **STAB OFF** soft key to deactivate. The current stabilization condition is shown in the upper right of the weather radar display.

4.9.6.7 Weather Attenuated Color Highlight (WATCH™) (GWX Radars Only)

While in horizontal scan mode, this feature can be used as a tool to determine areas of possible inaccuracies in displayed intensity due to weakening of the radar energy. This weakening is known as "attenuation." The radar energy weakens as it passes through areas of intense precipitation, large areas of lesser precipitation, and distance. Issues with the radome will also attenuate the radar energy. All these factors have an effect on the return intensity. The more energy that dissipates, the lesser the displayed intensity of the return. Accuracy of the displayed intensity of returns located in the shaded areas are suspect. Make maneuvering decisions with this information in mind. Proper antenna tilt management should still be employed to determine the extent of attenuation in a shaded area.

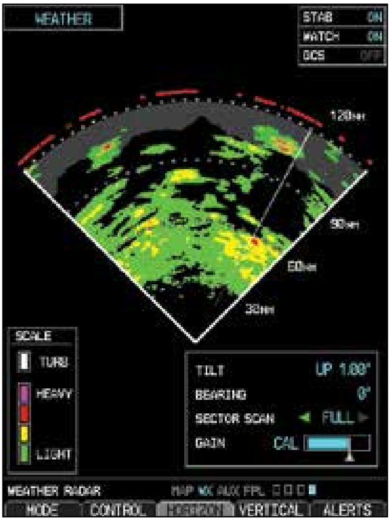
1) While viewing the Weather Radar page of the Wx page group, press the **CONTROL** soft key.

2) To activate or deactivate the WATCH™ feature, press the **WATCH** soft key.


WEATHER
120NM
90NM
60NM
30NM
SCALE
TURB
HEAVY
LIGHT
WEATHER RADAR
MAP WX AUX FPL
MODE
CONTROL
HORIZON
VERTICAL
ALERTS

STAB ON
WATCH ON
GCS OFF
TILT UP 1.00°
BEARING 0°
SECTOR SCAN ◄ FULL ►
GAIN CAL

Figure 4-86 Horizontal Scan without WATCH™


WEATHER
120NM
90NM
60NM
30NM
SCALE
TURB
HEAVY
LIGHT
WEATHER RADAR
MAP WX AUX FPL
MODE
CONTROL
HORIZON
VERTICAL
ALERTS

STAB ON
WATCH ON
GCS OFF
TILT UP 1.00°
BEARING 0°
SECTOR SCAN ◄ FULL ►
GAIN CAL

Figure 4-87 Horizontal Scan with WATCH™

4.9.6.8 Weather Alert (GWX Radars Only)

The Weather Alert feature indicates the presence of heavy radar returns beyond the currently displayed range. Weather Alert targets appear as red bands along the outer range ring at the approximate azimuth of the detected returns.

If the antenna tilt is adjusted too low, a weather alert can be generated by ground returns.

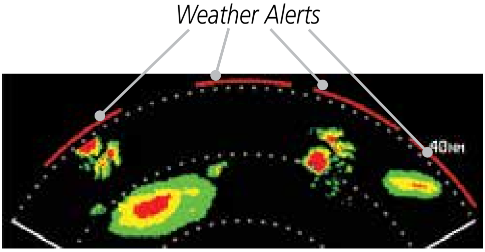

Weather Alerts
40NM

Figure 4-88 Weather Alert Display

If a Weather Alert is detected within ±10° of the aircraft heading, an text alert will be displayed on the MFD in the Alerts Window. These text Weather Alerts can be deactivated without deactivating the red bands on the radar display.

1) While viewing the Weather Radar page of the Wx page group, press the **MENU** key.

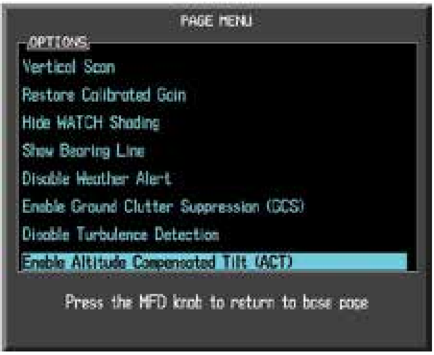
Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

2) To activate or deactivate Weather Alerts, turn the large or small **MFD** knob to highlight either "Enable Weather Alert" or "Inhibit Weather Alert."

4.9.6.9 Altitude Compensated Tilt (ACT) - GWX 70 only

Altitude Compensated Tilt (ACT) automatically adjusts the tilt to compensate for altitude changes as you climb or descend.

1) While viewing the Weather Radar Menu, turn the small or large **MFD** knob to highlight Enable Altitude Compensated Tilt (ACT) and then press **ENT**.


PAGE MENU
OPTIONS
Vertical Scan
Restore Calibrated Gain
Hide WATCH Shading
Show Bearing Line
Disable Weather Alert
Enable Ground Clutter Suppression (GCS)
Disable Turbulence Detection
Enable Altitude Compensated Tilt (ACT)

Press the MFD knob to return to base page

Figure 4-89 Weather Radar Page Menu

2) To deactivate ACT, repeat the sequence.

4.9.6.10 Turbulence Detection - GWX 70 only (optional)

Turbulence Detection activates a feature that detects and displays severe turbulence. Turbulence Detection is inactive at ranges greater that 160 NM. This optional feature requires a separate enablement. See your dealer for details. If Turbulence Detection is enabled and available, Turbulence Detection will be reported as Inactive in any of the following conditions:

- Scan orientation is not Horizontal
- Scan range is greater than 160 NM
- Radar mode is not Weather

1) While viewing the Weather Radar Menu, turn the small or large **MFD** knob to highlight Enable Turbulence Detection and then press **ENT**.

2) To deactivate Turbulence Detection, repeat sequence.

4.9.6.11 Ground Clutter Suppression (GCS) - GWX 70 only (optional)

Ground Clutter Suppression reduces the amount of returns as a result of highly reflective objects on the ground, such as buildings or cities, while maintaining the intensity and size of weather returns. his optional feature requires a separate enablement. See your dealer for details.

1) While viewing the Weather Radar Menu, turn the small or large **MFD** knob to highlight Enable Ground Clutter Suppression (GCS) and then press **ENT**.

2) To deactivate Ground Clutter Suppression, repeat the sequence.

4.9.7 Ground Mapping and Interpretation

A secondary use of the weather radar system is for the presentation of terrain. This can be a useful tool for verifying aircraft position. A "picture" of the ground is represented much like a topographical map that can be used as a supplement to the navigation map on the MFD.

Ground Map mode uses a different gain range than Weather mode. Different colors are also used to represent the intensity levels. The displayed intensity of ground target returns are defined in the following table. Use of the **GAIN** and **TILT** controls will help improve contrast so that specific ground targets can be recognized more easily. As previously discussed, the type and orientation of the target in relation to the aircraft affects the intensity displayed.

Ground Map Mode Color	GWX Radars Intensity	3rd Party Radars Level
BLACK	0 dB	0
LIGHT BLUE	> 0 dB to < 9 dB	1
YELLOW	9 dB to < 18 dB	2
MAGENTA	18 dB to < 27 dB	3 and above
BLUE	27 dB and greater	Not Used

Table 4-26 Ground Target Return Intensity Levels

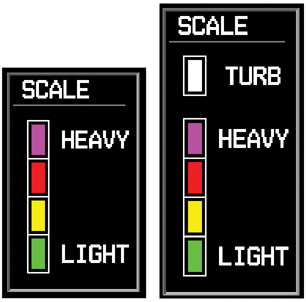
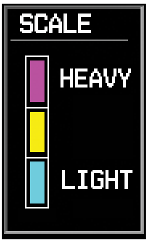


Figure 4-90 GWX Radar Weather Mode Scale



3rd Party Radar Weather Mode Scale

1) Press the **MODE** soft key.
2) Press the **GROUND** soft key to place the radar in Ground Map mode. A pop-up regarding caution in operating radar on the ground will appear. Turn the large **MFD** knob to highlight "YES" and then press **ENT**.

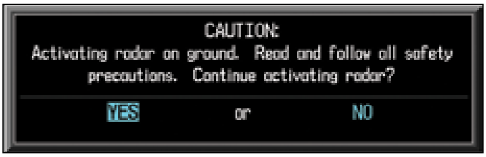

CAUTION:
Activating radar on ground. Read and follow all safety precautions. Continue activating radar?

Figure 4-91 Ground Radar Operation Caution

3) Press the **BACK** soft key.
4) Press the **MFD** knob to activate the cursor.
5) Turn the large **MFD** knob to place the cursor in the TILT field.
6) Adjust the antenna tilt angle by turning the small **MFD** knob to display ground returns at the desired distance.
7) Press the **MFD** knob to remove the cursor.

4.10 GFDS Weather (Optional)

GFDS Weather is an optional feature available with the Iridium® satellite system that is interfaced through the optional Garmin GSR 56. The primary maps for viewing Garmin Flight Data System (GFDS) Weather data are the Weather Data Link Pages in the Map Page Group. These are the only GDU 620 map displays capable of all available GFDS weather products. The Wx Weather pages may be oriented to either Track Up or North Up. Both GFDS and XM Weather may be installed and selected individually. GFDS Weather coverage is available throughout most of Europe, Canada and the U.S. Additional radar coverage areas are being added continuously. Selection of the Weather Source is made on the Aux - System Setup page.

More detail on GFDS weather products and coverage can be found at: http://fly.garmin.com/fly-garmin/gfds-weather/

***NOTE:** A system can be configured for both XM and GFDS, but both cannot be displayed a the same time.*

***WARNING:** Do not use data link weather information for maneuvering in, near, or around areas of hazardous weather. Information contained within data link weather products may not accurately depict current weather conditions.*

***WARNING:** Do not use the indicated data link weather product age to determine the age of the weather information shown by the data link weather product. Due to time delays inherent in gathering and processing weather data for data link transmission, the weather information shown by the data link weather product may be significantly older than the indicated weather product age.*

4.10.1 GFDS Registration

4.10.1.1 Register With GFDS

It is necessary to register the GDU with GFDS to utilize the weather products.

1) Call Garmin Customer Service to create a GFDS account. Provide the GDU System ID and airframe info (model, tail number, etc).

2) Customer Service will issue an access code to enter on the GFDS Registration page.

3) While viewing a WX Map page of the WX page group, press the **MENU** key to display the Page Menu Options.

4) Turn the large **MFD** knob to highlight “Register With GFDS.” Press **ENT.**

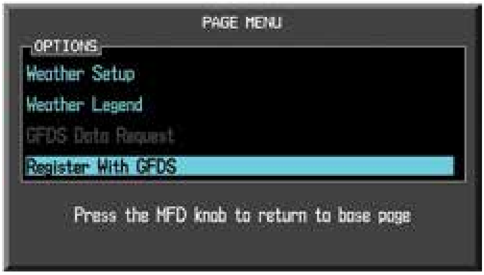
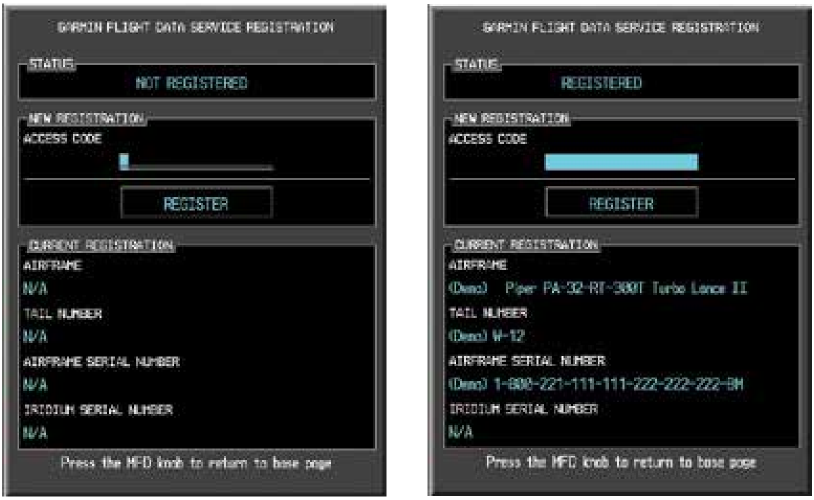


Figure 4-92 Select GFDS Registration

5) Turn the small **MFD** knob to select values and the large **MFD** knob to move to the next position. Highlight **REGISTER** and press **ENT** to complete the process. The GDU will contact the GFDS servers using the GSR 56 transceiver. If the access code and system ID are correct, it will download and display the airframe info.



GARMIN FLIGHT DATA SERVICE REGISTRATION
STATUS
NOT REGISTERED
NEW REGISTRATION
ACCESS CODE
REGISTER
CURRENT REGISTRATION
AIRFRAME
N/A
TAIL NUMBER
N/A
AIRFRAME SERIAL NUMBER
N/A
IRIDIUM SERIAL NUMBER
N/A
Press the MFD knob to return to base page

GARMIN FLIGHT DATA SERVICE REGISTRATION
STATUS
REGISTERED
NEW REGISTRATION
ACCESS CODE
REGISTER
CURRENT REGISTRATION
AIRFRAME
(Demo) Piper PA-32-RT-300T Turbo Lance II
TAIL NUMBER
(Demo) W-12
AIRFRAME SERIAL NUMBER
(Demo) 1-800-221-111-111-222-222-222-BM
IRIDIUM SERIAL NUMBER
N/A
Press the MFD knob to return to base page

Figure 4-93 GFDS Registration Page (Default and Completed)

4.10.1.2 Deactivate Unit Registration With GFDS

Registration of the GDU unit with GFDS can be deactivated so that the unit can no longer make requests to GFDS. This does not cancel the subscription.

1) While viewing a WX Map page of the WX page group, press the **MENU** key to display the Page Menu Options.

2) Turn the large **MFD** knob to highlight "Register With GFDS." Press **ENT.**

3) With the Access Code field highlighted, press **CLR** to remove the access code.

4) Any weather requests will now fail and the system will no longer be linked to the GFDS account.

4.10.2 Using GFDS Satellite Weather Products

When a weather product is active on the Weather Data Link Page or the Navigation Map Page, the age of the data is displayed on the screen. The age of the product is based on the time difference between when the data was assembled on the ground and the current GPS time. Weather products are refreshed at selectable intervals.

If for any reason, a weather product is not refreshed within the 30, 60, 90, or 120 minute Expiration Time intervals, the data is considered expired and is removed from the display. This ensures that the displayed data is consistent with what is currently being broadcast by GFDS Satellite Radio services. If more than half of the expiration time has elapsed from the time the data is received, the color of the product age displayed changes to yellow.

4.10.3 Customizing the GFDS Weather Map

Each Wx Map page may be customized individually. The Wx Map pages are customized by selecting options from the Page Menu. The Page Menu options include choices for Weather Setup and displaying the Weather Legends. The Weather Setup choice covers selections for adjusting the viewing ranges of the weather products.

1) While viewing a WX Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the "Weather Setup" option. Press **ENT.**

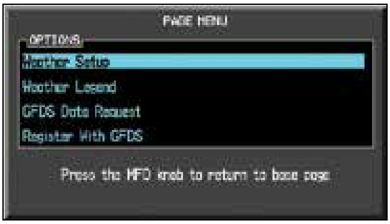
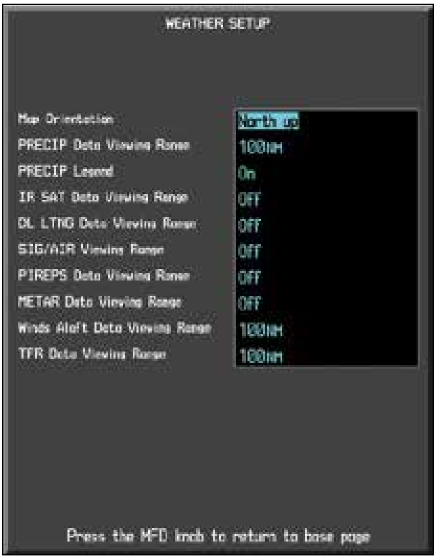


Figure 4-94 Weather Page Menu Options

2) With the Weather Setup Menu displayed, turn the Large **MFD** knob to select the desired item.


WEATHER SETUP

Map Orientation: North up
PRECIP Data Viewing Range: 100NM
PRECIP Legend: On
IR SAT Data Viewing Range: OFF
DL LTNG Data Viewing Range: OFF
SIG/AIR Viewing Range: OFF
PIREPS Data Viewing Range: OFF
METAR Data Viewing Range: OFF
Winds Aloft Data Viewing Range: 100NM
TFR Data Viewing Range: 100NM

Press the MFD knob to return to base page

Figure 4-95 Weather Data Link Setup Menu Options

3) Turn the small **MFD** knob to select the desired weather feature option.

4) Press **ENT** to save a selection.
5) Turn the large **MFD** knob to the next desired option or press the small **MFD** knob to cancel and return to the GFDS Weather Data Link Map Page.

WX Page Menu - Weather Setup	
Menu Item	**Adjustment**
Map Orientation	North Up, Track Up
PRECIP Data Viewing Range	Off, 50 NM to 500 NM
PRECIP Legend	On/Off
IR SAT Data Viewing Range	Off, 10 NM to 500 NM
Lightning Data Viewing Range	Off, 10 NM to 500 NM
SIG/Air Viewing Range	Off, 10 NM to 500 NM
PIREPS Viewing Range	Off, 10 NM to 500 NM
METAR Data Viewing Range	Off, 10 NM to 500 NM
Wnd Aloft Data Viewing Range	Off, 10 NM to 500 NM
TFR Data Viewing Range	Off, 10 NM to 500 NM

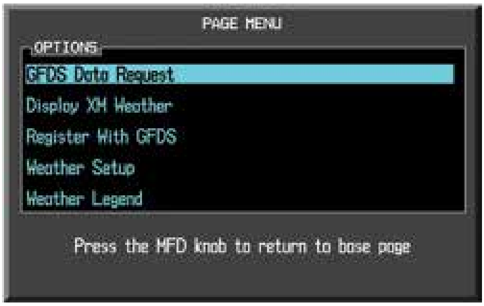
Table 4-27 GFDS Weather Page Menu Setup Options

4.10.4 GFDS Data Request

It is necessary to request the downloading of weather products. Requests can be sent manually or set to automatically update at a selected rate.

1) While viewing a WX Map page of the WX page group, press the **MENU** key to display the Page Menu Options.

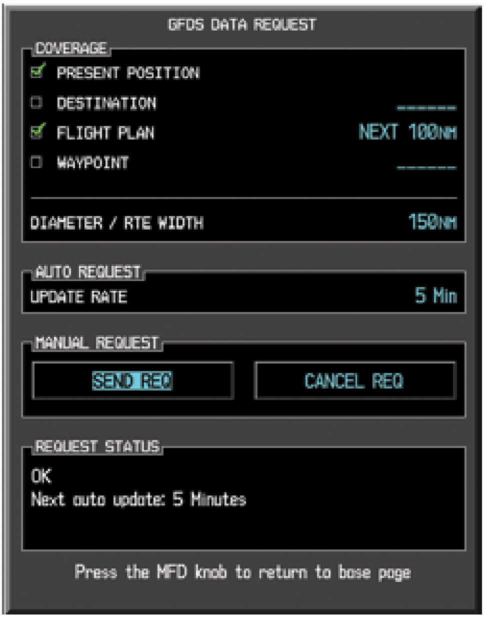
2) Turn the large **MFD** knob to highlight "GFDS Data Request." Press **ENT.**



Press the MFD knob to return to base page

Figure 4-96 Select GFDS Data Request

3) Turn the small **MFD** knob to select values and the large **MFD** knob to move to the next position.



☑ PRESENT POSITION
☐ DESTINATION ------
☑ FLIGHT PLAN NEXT 100NM
☐ WAYPOINT ------
DIAMETER / RTE WIDTH 150NM
UPDATE RATE 5 Min
OK
Next auto update: 5 Minutes
Press the MFD knob to return to base page

Figure 4-97 GFDS Data Request Page

4.10.4.1 GFDS Data Request Coverage

Present Position GFDS Data Request

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options.

2) Turn the large **MFD** knob to highlight "GFDS Data Request." Press **ENT.**

3) Turn the large **MFD** knob to highlight "Present Position." Press **ENT.**

4) The Present Position box will be checked and weather information will be requested around your present position.

5) To deselect Present Position reporting, turn the large **MFD** knob to highlight "Present Position." Press **ENT.**

Destination GFDS Data Request

1) Turn the large **MFD** knob to highlight "Destination." Press **ENT.**

2) The Destination box will be checked and weather information will be requested around your flight plan destination.

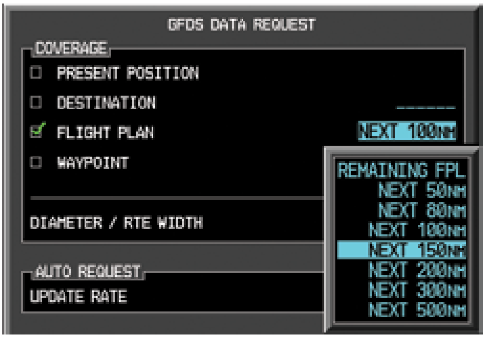
Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

3) To deselect Destination reporting, turn the large **MFD** knob to highlight "Destination." Press **ENT.**

Flight Plan GFDS Data Request

1) Turn the large **MFD** knob to highlight "Flight Plan." Press **ENT**.

2) The range list will now be highlighted. Turn the small **MFD** knob to highlight the desired range and press **ENT**.


GFDS DATA REQUEST
COVERAGE
☐ PRESENT POSITION
☐ DESTINATION

☑ FLIGHT PLAN
NEXT 100NM
☐ WAYPOINT
DIAMETER / RTE WIDTH
AUTO REQUEST
UPDATE RATE
REMAINING FPL
NEXT 50NM
NEXT 80NM
NEXT 100NM
NEXT 150NM
NEXT 200NM
NEXT 300NM
NEXT 500NM

Figure 4-98 Flight Plan GFDS Data Request

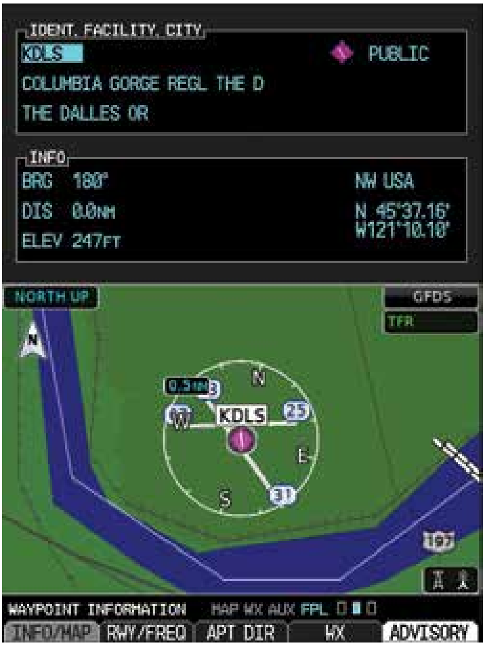
3) The Flight Plan box will be checked and weather information will be requested along your flight plan forward of your present position for the range selected.

4) To deselect Flight Plan reporting, turn the large **MFD** knob to highlight "Flight Plan." Press **ENT.**

Waypoint GFDS Data Request

1) Turn the large **MFD** knob to highlight "Waypoint." Press **ENT**.

2) The Waypoint Selection field will now be highlighted. Turn the small **MFD** knob to select the first character. Turn the large **MFD** knob to highlight the next character. When finished selecting the waypoint name, press **ENT**.



IDENT, FACILITY, CITY
KDLS PUBLIC
COLUMBIA GORGE REGL THE D
THE DALLES OR

INFO
BRG 180°
DIS 0.0NM
ELEV 247FT
NW USA
N 45°37.16'
W121°10.10'

NORTH UP
GFDS
TFR
N
0.5NM
KDLS
N
W
E
S
25
31
197
WAYPOINT INFORMATION
MAP WX AUX FPL
INFO/MAP
RWY/FREQ
APT DIR
WX
ADVISORY

Figure 4-99 Waypoint GFDS Data Request

3) The Waypoint box will be checked and weather information will be requested around the selected waypoint for the range selected (next operation).

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

Diameter/Route Width GFDS Data Request

1) After selecting a coverage option in the previous section, the Diameter/Route Width field will now be highlighted.

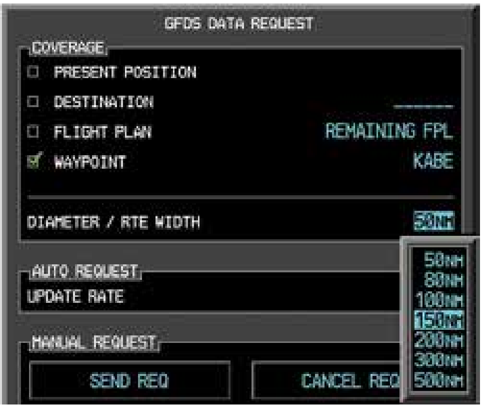

GFDS DATA REQUEST
COVERAGE
☐ PRESENT POSITION
☐ DESTINATION
☐ FLIGHT PLAN
☑ WAYPOINT
REMAINING FPL
KABE
DIAMETER / RTE WIDTH
50NM
AUTO REQUEST
UPDATE RATE
MANUAL REQUEST
SEND REQ
CANCEL REQ
50NM
80NM
100NM
150NM
200NM
300NM
500NM

Figure 4-100 Waypoint GFDS Data Request Range

2) Turn the small **MFD** knob to select the desired Diameter/Route Width and then press **ENT**.

4.10.4.2 GFDS Data Request Auto Request

1) Turn the large **MFD** knob to highlight "Auto Request - Update Rate."

2) Turn the small **MFD** knob to select "Off" or an Update Rate. When finished selecting the Update Rate, press **ENT**. The Update Rate will default to "OFF" at each power cycle.

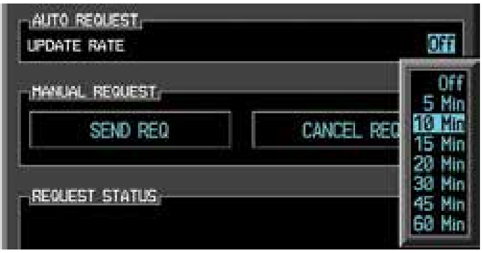

AUTO REQUEST
UPDATE RATE
Off
MANUAL REQUEST
SEND REQ
CANCEL REQ
REQUEST STATUS
Off
5 Min
10 Min
15 Min
20 Min
30 Min
45 Min
60 Min

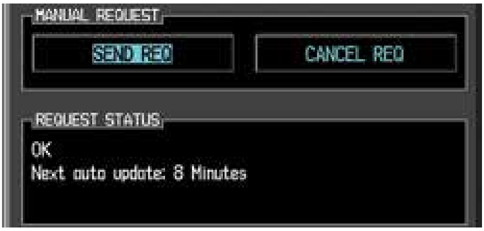
Figure 4-101 GFDS Data Request Auto Update Rate

4.10.4.3 GFDS Data Request Manual Request

The GFDS weather data may be updated at any time regardless of the automatic update timing by selecting a Manual Request. When multiple requests are made, some products are merged with the old data (SIGMETs/AIRMETs, TAFs, TFRs, and METARs), but the old data of other products is discarded.

1) Turn the large **MFD** knob to highlight "Manual Request - Send Req."

2) Press **ENT**.



OK
Next auto update: 8 Minutes

Figure 4-102 Manual GFDS Data Request

3) The update request will occur immediately. The action will be noted in the Request Status window. The Auto Request time will be reset to the selected value.

4.10.4.4 GFDS Data Request Status Window

The Request Status window will show a response such as "OK" when manual requests are made. The time for the next auto update will be shown.

4.10.5 Weather Page Map Orientation

The Orientation option sets the orientation of the Wx Data Link Map pages.

1) While viewing the GFDS Weather Map 1, 2, or 3 of the Wx page group, press the **MENU** key. With "Weather Setup" highlighted, press **ENT**.

2) With the "Map Orientation" option active, turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.6 Precipitation (PRECIP) Data Viewing Range

The PRECIP Viewing Range option allows you to select the map range where at and below the selected value PRECIP weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, PRECIP weather data will not be shown. In the figure below where 500 NM is selected, PRECIP data will be shown at map ranges of 500 NM and lower. TFRs and METARs are the only weather products shown below 10 NM.

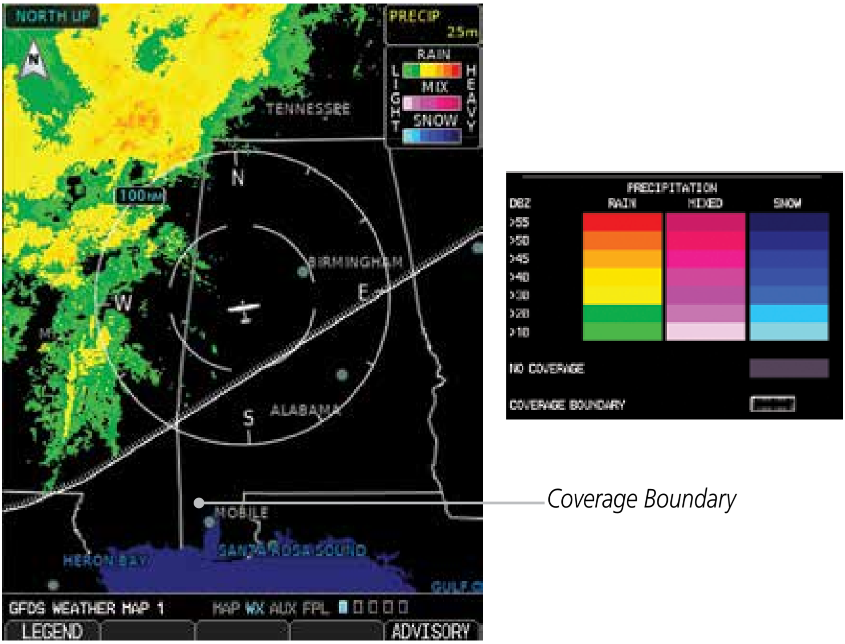

NORTH UP
PRECIP
25m
RAIN
MIX
SNOW
LIGHT
HEAVY
TENNESSEE
100NM
N
W
E
S
BIRMINGHAM
ALABAMA
MOBILE
HERON BAY
SANTA ROSA SOUND
GULF O
GFDS WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY
PRECIPITATION
DBZ
RAIN
MIXED
SNOW
>55
>50
>45
>40
>30
>20
>10
NO COVERAGE
COVERAGE BOUNDARY
Coverage Boundary

Figure 4-103 GFDS PRECIP Weather Map Display and Legend

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The Weather Setup option will be highlighted. Press **ENT.**

2) Turn the large **MFD** knob to highlight PRECIP Data Viewing Range. Turn the small **MFD** knob to highlight the desired value.

3) Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.7 PRECIP Legend

The PRECIP Legend selection provides the option of displaying an abbreviated version of the PRECIP legend in the top right region of the MFD. The full legend is available by pressing the **LEGEND** soft key.

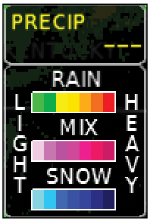


Figure 4-104 GFDS PRECIP Legend

1) While viewing a GFDS Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The Weather Setup option will be highlighted. Press **ENT.**

2) Turn the large **MFD** knob to highlight PRECIP Legend.

3) Turn the small **MFD** knob to highlight Off or On. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.8 GFDS Infrared Satellite (IR SAT) Data Viewing Range

IR SAT data is available over North America and Europe and depicts cloud top temperatures from satellite imagery. Brighter cloud top colors indicate cooler temperatures occurring at higher altitudes. Information is updated every half hour.

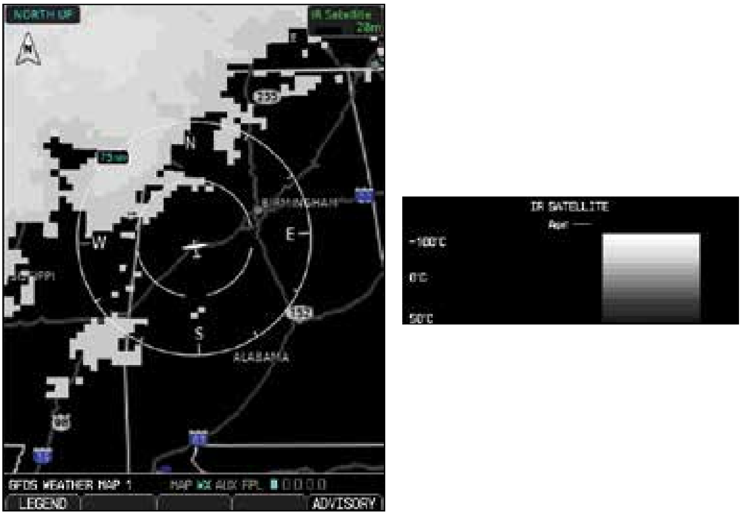


Figure 4-105 GFDS Infrared Satellite Data Map Display and Legend

IR SAT Data Viewing Range

The IR SAT Data Viewing Range option allows you to select the map range where at and below that value IR SAT weather products will be shown on the selected MFD GFDS Weather Map page (1, 2, or 3). When Off is selected, IR SAT will not be shown. For the selected value (such as 250 NM) is selected, IR SAT data will be shown at map ranges of the selected value (250 NM) and lower.

1) While viewing a GFDS Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the Weather Setup option and press **ENT.**

2) Turn the large **MFD** knob to highlight IR SAT Data Viewing Range. Turn the small **MFD** knob to highlight the desired value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.9 Data Link Lightning (DL LTNG) Data Viewing Range

Lightning data shows the approximate location of cloud-to-ground lightning strikes. A strike icon represents a strike that has occurred within a two-kilometer region. The exact location of the lightning strike is not displayed. Only cloud to ground strikes are reported in the US and extreme southern Canada (cloud to cloud strikes are not reported).

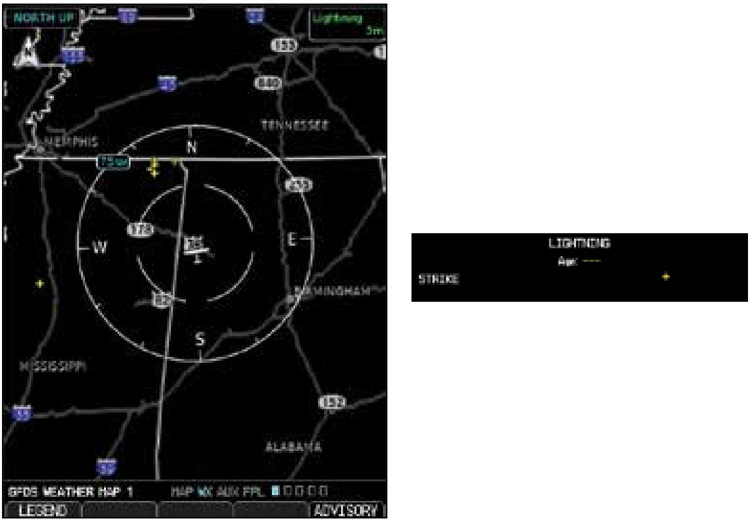


Figure 4-106 GFDS Data Link Lightning and Legend

The Lightning Data Viewing Range option allows you to select the map range where at and below that value Lightning weather products will be shown on the selected MFD GFDS Weather Map page (1, 2, or 3). When Off is selected, Lightning will not be shown. Where a value (such as 250 NM) is selected, GFDS data will be shown at map ranges of the selected value (250 NM) and lower.

1) While viewing a GFDS Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the Weather Setup option and press **ENT.**

2) Turn the large **MFD** knob to highlight DL LTNG Data Viewing Range.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.10 SIGMETs and AIRMETs (SIG/AIR)

SIGMETs (SIGnificant METeorological Information) and AIRMETs (AIRmen's METeorological Information) are broadcast for potentially hazardous weather considered of importance to aircraft. A Convective SIGMET is issued for hazardous convective weather. A localized SIGMET is a significant weather condition occurring at a localized geographical position.

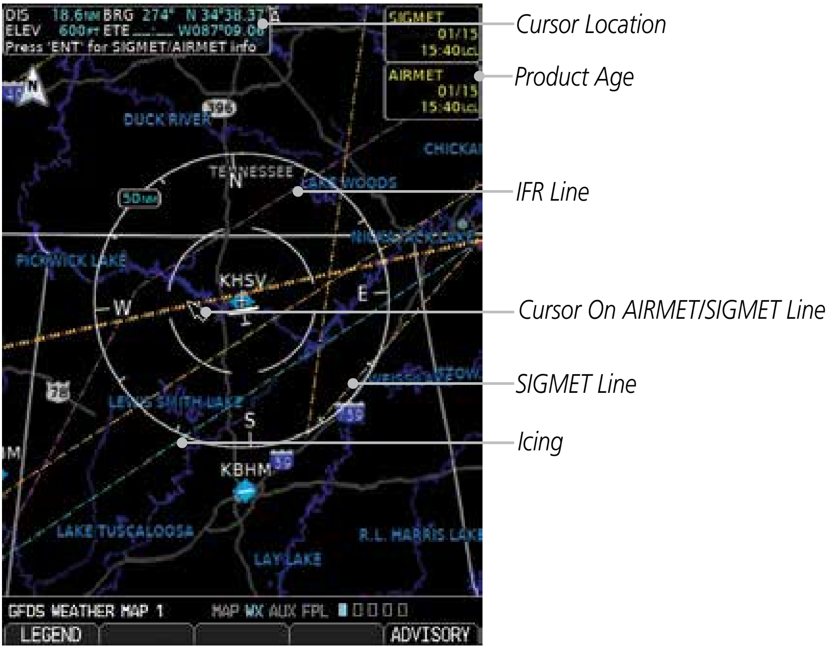

DIS 18.6NM BRG 274° N 34°38.37'
ELEV 600FT ETE ___:___ W087°09.08'
Press 'ENT' for SIGMET/AIRMET info
SIGMET 01/15 15:40LCL
AIRMET 01/15 15:40LCL
DUCK RIVER
TENNESSEE
CHICKAI
50NM
N
PICKWICK LAKE
KHSV
W
E
S
LEWIS SMITH LAKE
KBHM
LAKE TUSCALOOSA
R.L. HARRIS LAKE
LAY LAKE
GFDS WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY
Cursor Location
Product Age
IFR Line
Cursor On AIRMET/SIGMET Line
SIGMET Line
Icing

Figure 4-107 GFDS Weather Page - AIRMETs/SIGMETs

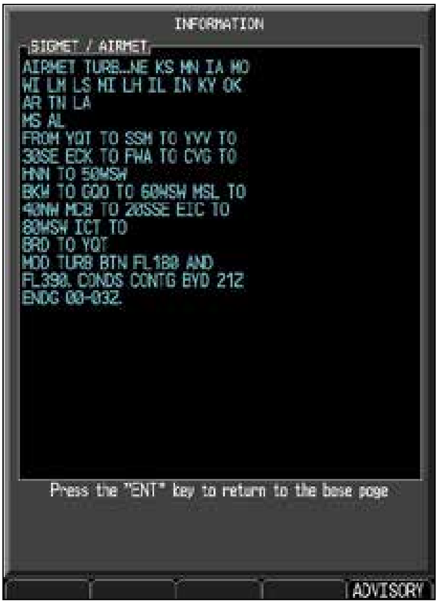
When enabled, SIGMET/AIRMETs advise the pilot of potentially hazardous weather to all aircraft. SIGMET/AIRMET data covers icing, turbulence, dust, and volcanic ash as issued by the National Weather Service. The update rate is every 12 minutes in the U.S. Elsewhere, updates are made as they are issued.

Viewing Textual SIGMETs/AIRMETs

Textual SIGMET/AIRMETs can be viewed by selecting an SIGMET/AIRMET line on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a SIGMET/AIRMET line. Press **ENT**.

2) The Waypoint Information page for that line will now be shown. Press the **WX** soft key to view weather information.


INFORMATION

SIGMET / AIRMET

```
AIRMET TURB…NE KS MN IA MO
WI LM LS MI LH IL IN KY OK
AR TN LA
MS AL
FROM YQT TO SSM TO YVV TO
30SE ECK TO FWA TO CVG TO
HNN TO 50WSW
BKW TO GQO TO 60WSW MSL TO
40NW MCB TO 20SSE EIC TO
80WSW ICT TO
BRD TO YQT
MOD TURB BTN FL180 AND
FL390. CONDS CONTG BYD 21Z
ENDG 00-03Z.
```

Press the "ENT" key to return to the base page

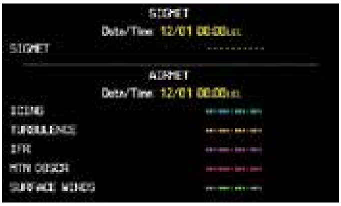


Figure 4-108 GFDS Weather - AIRMETs/SIGMETs Detail and Legend

When enabled, the following AIRMETs are available for display:

- Icing
- Turbulence
- IFR conditions
- Mountain obscuration
- Surface winds

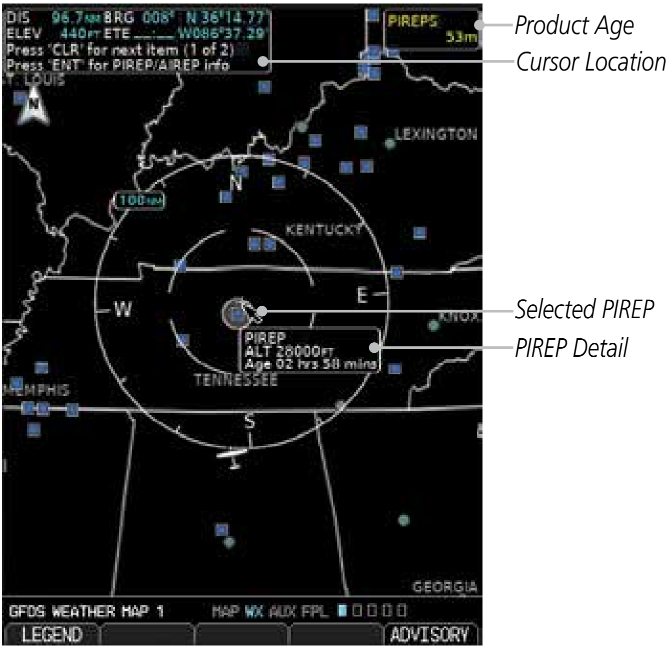
SIGMET/AIRMET Viewing Range

The SIGMET/AIRMET Viewing Range option allows you to select the map range where at and below that value SIGMET/AIRMET products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, SIGMET/AIRMET will not be shown. Where a value (such as 250 NM) is selected, SIGMET/AIRMET data will be shown at map ranges of the selected value (250 NM) and lower.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the Weather Setup option and press **ENT.**
2) Turn the large **MFD** knob to highlight SIG/AIR Viewing Range.
3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.11 AIREP/PIREP

Pilot Weather Reports (PIREPs) provide timely weather information for a particular route of flight. When significant weather conditions are reported or forecast, Air Traffic Control (ATC) facilities are required to solicit PIREPs. A PIREP may contain non-forecast adverse weather conditions, such as low in-flight visibility, icing conditions, wind shear, and turbulence. PIREPs are issued as either Routine (UA) or Urgent (UUA).



DIS 96.7NM BRG 008° N36°14.77'
ELEV 440FT ETE __:__ W086°37.29'
Press 'CLR' for next item (1 of 2)
Press 'ENT' for PIREP/AIREP info

PIREPS 53m

PIREP
ALT 28000FT
Age 02 hrs 58 mins

Product Age
Cursor Location
Selected PIREP
PIREP Detail

Figure 4-109 GFDS Weather Page - AIREPs/PIREPs

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the PIREPS Viewing Range value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

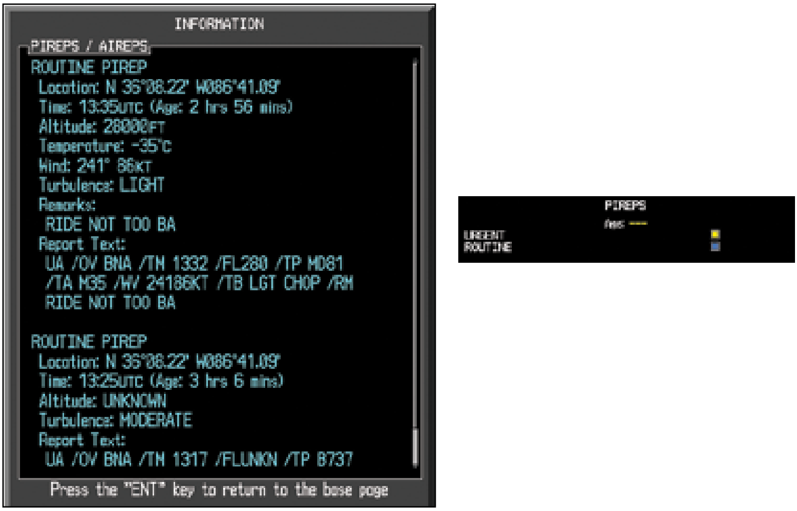
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Viewing Textual AIREPs/PIREPs

Textual AIREPs/PIREPs can be viewed by selecting an AIREP/PIREP on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight an airport with an AIREP/PIREP. Press **ENT**.

2) The Waypoint Information page for that airport will now be shown. Press the **WX** soft key to view weather information for the waypoint.



```
INFORMATION
PIREPS / AIREPS
ROUTINE PIREP
 Location: N 36°08.22' W086°41.09'
 Time: 13:35UTC (Age: 2 hrs 56 mins)
 Altitude: 28000FT
 Temperature: -35°C
 Wind: 241° 86KT
 Turbulence: LIGHT
 Remarks:
  RIDE NOT TOO BA
 Report Text:
  UA /OV BNA /TM 1332 /FL280 /TP MD81
  /TA M35 /WV 24186KT /TB LGT CHOP /RM
  RIDE NOT TOO BA

ROUTINE PIREP
 Location: N 36°08.22' W086°41.09'
 Time: 13:25UTC (Age: 3 hrs 6 mins)
 Altitude: UNKNOWN
 Turbulence: MODERATE
 Report Text:
  UA /OV BNA /TM 1317 /FLUNKN /TP B737
Press the "ENT" key to return to the base page
```

```
PIREPS
Age: ----
URGENT   🟨
ROUTINE  🟦
```

Figure 4-110 GFDS Weather - AIREPs/PIREPs Detail and Legend

4.10.12 METARs

***NOTE:** Atmospheric pressure reported for METARs is given in hectopascals (hPa), except in the United States, where it is reported in inches of mercury (in Hg). Temperatures are reported in Celsius.*

***NOTE:** METAR information is only displayed within the installed aviation database service area.*

METAR (METeorological Aerodrome Report), known as an Aviation Routine Weather Report, is the standard format for current weather observations. METARs are generally updated hourly, but some site are more frequent. Special updates are done as conditions warrant. METARs typically contain information about the temperature, dew point, wind, precipitation, cloud cover, cloud heights, visibility, and barometric pressure. They can also contain information on precipitation amounts, lightning, and other critical data. METARs are shown as colored flags at airports that provide them.

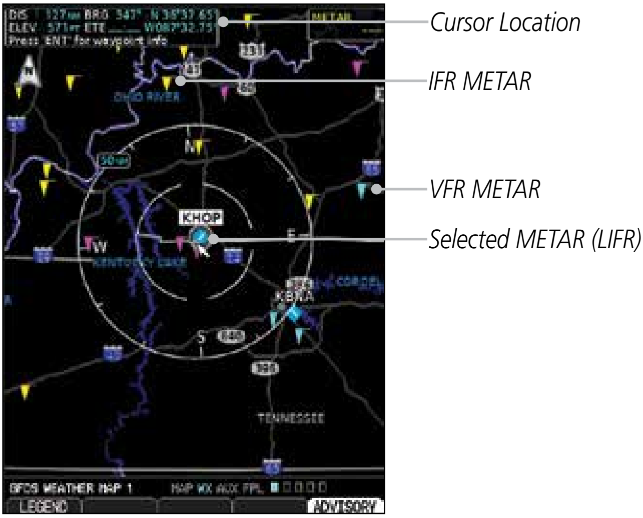

DIS 127NM BRG 347° N 36°37.65'
ELEV 571FT ETE ___ W087°32.75'
Press ENT for waypoint info
METAR
OHIO RIVER
KENTUCKY LAKE
KHOP
KBNA
TENNESSEE
N
E
S
W
GFDS WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY
Cursor Location
IFR METAR
VFR METAR
Selected METAR (LIFR)

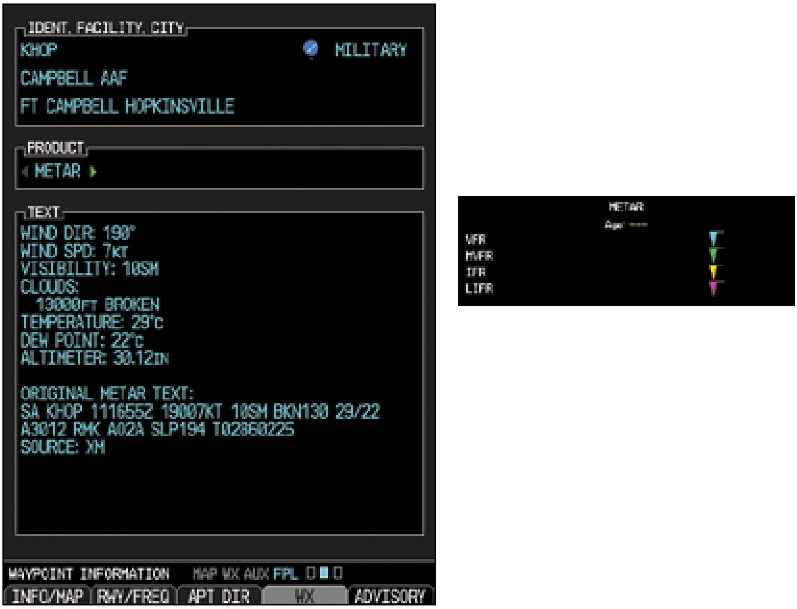
Figure 4-111 GFDS Weather - Graphic METARs

Viewing Textual METARs

Textual METARs can be viewed by selecting an airport on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight an airport with a METAR flag. Press **ENT**.

2) The Waypoint Information page for that airport will now be shown. Press the **WX** soft key to view weather information for the waypoint.



```
IDENT, FACILITY, CITY
KHOP                    MILITARY
CAMPBELL AAF
FT CAMPBELL HOPKINSVILLE

PRODUCT
METAR

TEXT
WIND DIR: 190°
WIND SPD: 7KT
VISIBILITY: 10SM
CLOUDS:
  13000FT BROKEN
TEMPERATURE: 29°C
DEW POINT: 22°C
ALTIMETER: 30.12IN

ORIGINAL METAR TEXT:
SA KHOP 111655Z 19007KT 10SM BKN130 29/22
A3012 RMK A02A SLP194 T02880225
SOURCE: XM

WAYPOINT INFORMATION    MAP WX AUX FPL
INFO/MAP | RWY/FREQ | APT DIR | WX | ADVISORY
```

Figure 4-112 GFDS Weather - METARs Detail and Legend

METAR Viewing Range

The METAR Viewing Range option allows you to select the map range where at and below that value METAR weather products will be shown on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, METARs will not be shown. Where a value (such as 150 NM) is selected, METAR data will be shown at map ranges of the selected value (150 NM) and lower.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the Weather Setup option and press **ENT.**

2) Turn the large **MFD** knob to highlight METAR Data Viewing Range.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.13 Winds Aloft

Winds Aloft data shows the forecast wind speed and direction at the surface and at selected altitudes. Altitudes can be selected in 3000 foot increments from the surface up to 42,000 feet MSL. Pressing the **WX Alt Dn** or **WX Alt Up** soft keys steps down or up in 3,000 foot increments.

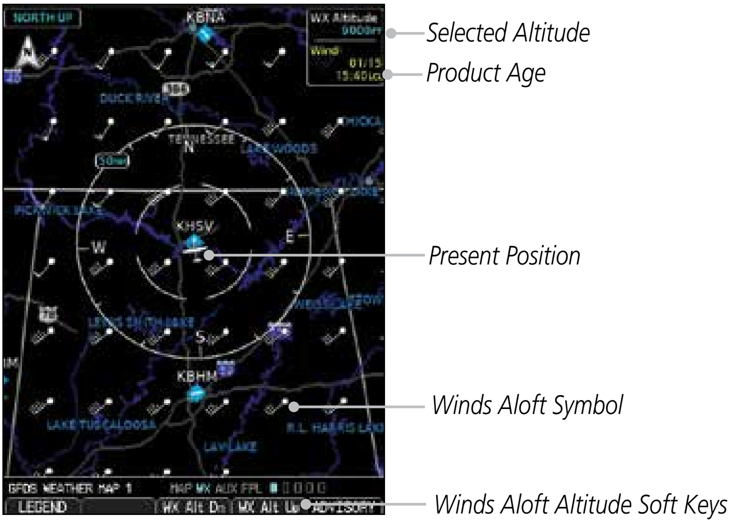
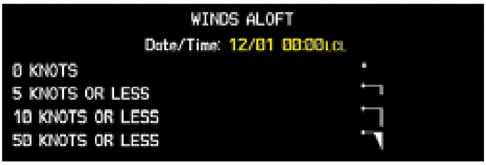

NORTH UP
KBNA
WX Altitude
9000ft
Wind
01/15
15:40LCL
DUCK RIVER
TENNESSEE
LAKEWOODS
PICKWICK LAKE
KHSV
N
E
W
S
KBHM
LAKE TUSCALOOSA
R.L. HARRIS LAKE
GFDS WEATHER MAP 1
MAP WX AUX FPL
LEGEND
WX Alt Dn
WX Alt Up
ADVISORY
Selected Altitude
Product Age
Present Position
Winds Aloft Symbol
Winds Aloft Altitude Soft Keys

Figure 4-113 GFDS Weather - Winds Aloft


WINDS ALOFT

Date/Time: 12/01 00:00LCL

0 KNOTS
5 KNOTS OR LESS
10 KNOTS OR LESS
50 KNOTS OR LESS

Figure 4-114 GFDS Weather - Winds Aloft Legend

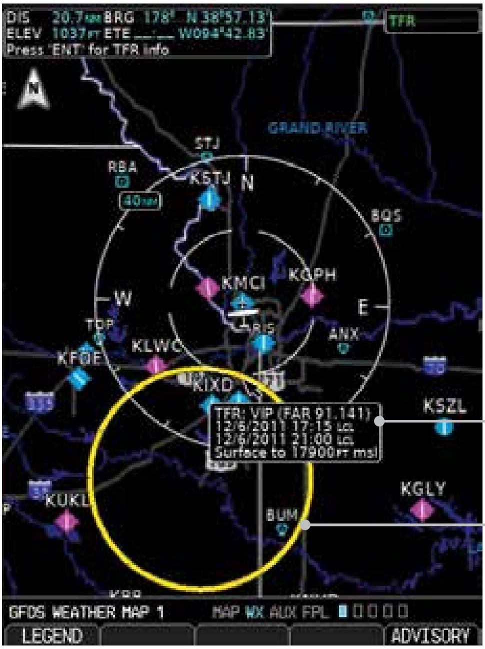
Winds Aloft Data Viewing Range

The Winds Aloft Data Viewing Range option allows you to select the map range where at and below that value Winds Aloft weather products will appear on the selected MFD Wx Data Link Map page (1, 2, or 3). When Off is selected, Winds Aloft will not be shown. Where 150 NM is selected, Winds Aloft data will be shown at map ranges of 150 NM and lower.

1) While viewing a WX Data Link Map page of the WX page group, press the **MENU** key to display the Page Menu Options. Turn the large **MFD** knob to highlight the Weather Setup option and press **ENT.**
2) Turn the large **MFD** knob to highlight Winds Aloft Data Viewing Range.
3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.
4) Press the small **MFD** knob to cancel selection or to end editing and return to the WX page or turn the large **MFD** knob to the next option.

4.10.14 GFDS TFRs

Temporary Flight Restrictions (TFRs) provide detailed information for local short term restrictions. The update rate is approximately every 20 minutes.



DIS 20.7NM BRG 178° N 38°57.13'
ELEV 1037FT ETE __:__ W094°42.83'
Press 'ENT' for TFR info

TFR: VIP (FAR 91.141)
12/6/2011 17:15 LCL
12/6/2011 21:00 LCL
Surface to 17900FT msl

TFR Detail

Select TFR Symbol To View Details

Figure 4-115 GFDS Weather - TFRs

The Temporary Flight Restriction (TFR) viewing range option selects whether TFR information is shown on the GFDS Weather Map. TFR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. For the value (such as 500 NM) selected, TFR information will be shown at map ranges of that value (500 NM), and lower.

1) While viewing a GFDS Weather Map page of the WX page group, turn the large **MFD** knob to highlight the TFR Data Viewing Range option.

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the GFDS Weather Map page.

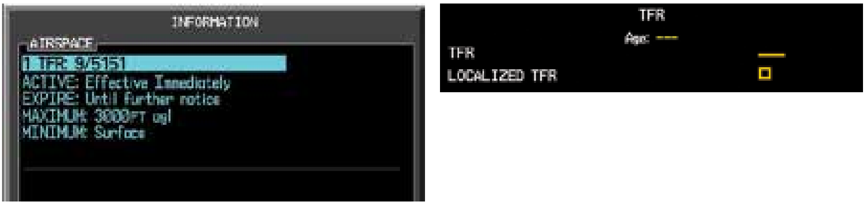
Viewing Textual TFRs

Textual TFRs can be viewed by selecting a TFR outline on the Weather (WX) pages.

1) While viewing a GFDS Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a TFR symbol (yellow circle). Press **ENT**.

2) The TFR details will be shown.

3) Press the small **MFD** knob or ENT to return to the Weather page.



1 TFR: 9/5151
ACTIVE: Effective Immediately
EXPIRE: Until further notice
MAXIMUM: 3000FT agl
MINIMUM: Surface

TFR
Age: ---
TFR —
LOCALIZED TFR ☐

Figure 4-116 GFDS Weather - Textual TFRs and Legend

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.11 FIS-B Weather (Optional)

WSR-88D weather surveillance radar or NEXRAD (NEXt generation RADar) is a Doppler radar system that has greatly improved the detection of meteorological events such as thunderstorms, tornadoes, and hurricanes. An extensive network of NEXRAD stations provides almost complete radar coverage of the continental United States, Alaska, and Hawaii. The unobstructed range of each NEXRAD is 124 nautical miles. The GDL 88 receives the FIS-B information and sends it to the GDU 620.

NOTE: *The GDL 88 will send all FIS-B weather and NOTAM/TFR information that it receives. There may be more information available than is received by the GDL 88. This can lead to the GDL88, and subsequently the GDU620, displaying the status of the FIS-B data as "received" and "current" even though some of the data for the region is missing.*

4.11.1 NEXRAD Abnormalities

There are possible abnormalities regarding displayed NEXRAD images. Some, but not all, causes of abnormal displayed information include:

- Ground Clutter
- Strobes and spurious radar data
- Sun strobes, when the radar antenna points directly at the sun
- Military aircraft deploy metallic dust which can cause alterations in radar scans
- Interference from buildings or mountains, which may cause shadows
- Scheduled maintenance may put a radar off-line

4.11.2 NEXRAD Limitations

Certain limitations exist regarding the NEXRAD radar displays. Some, but not all, are listed for the user's awareness:

- The Regional NEXRAD "pixels" are 1.5 minutes (1.5 nautical miles = 2.78 km) wide by 1 minute (1 nautical miles = 1.852 km) tall. The CONUS NEXRAD "pixels" are 7.5 minutes (7.5 nautical miles = 13.89 km) wide by 5 minutes (5 nautical miles = 9.26 km) wide. Above 60 degrees of latitude the Regional NEXRAD "pixels" are 3 minutes/nautical miles. CONUS NEXRAD is not available above 60 degrees of latitude. The intensity level reflected by the pixel will be the highest level sampled within the area covered by each pixel.

NOTE: *Where it is noted that NOTAM data is available, it is possible only a subset of the data is available and that more NOTAM reports may arrive in future updates. Updates occur approximately every ten minutes.*

4.11.3 NEXRAD Intensity

Colors are used to identify the different NEXRAD echo intensities (reflectivity) measured in dBZ (decibels of Z). “Reflectivity” is the amount of transmitted power returned to the radar receiver. Reflectivity (designated by the letter Z) covers a wide range of signals (from very weak to very strong). So, a more convenient number for calculations and comparison, a decibel (or logarithmic) scale (dBZ), is used. The dBZ values increase as the strength of the signal returned to the radar increases.

4.11.4 NEXRAD

When enabled, NEXRAD weather information is shown. Composite data from all of the NEXRAD radar sites in the United States is shown. This data is composed of the maximum reflectivity from the individual radar sweeps. The display of the information is color-coded to indicate the weather level severity. Refer to the legend for a description of the color code.

The NEXRAD option has selections of Regional, CONUS, or Combined NEXRAD. CONUS NEXRAD includes a composite of available NEXRAD radar imagery across the 48 states. Regional NEXRAD is a composite of available NEXRAD radar imagery in a local area, showing a more detailed image than CONUS NEXRAD. FIS-B weather data reception requires line-of-site communication between the receiver and the ADS-B ground station. Incomplete Regional and/or CONUS NEXRAD imagery displayed on the MAP and FIS-B Weather Pages of the affected products is an indicator of poor FIS-B reception.

Affected Areas

Any area in the continental United States (CONUS) or Alaska where the distance from ADS-B ground stations, or the combined effect of distance and low altitude, is sufficiently great may cause poor reception. A good source of information for ground station coverage can be found at:

http://www.faa.gov/

Reception will improve in some affected areas as the FAA completes the NextGen ADS-B ground station infrastructure. However, due to line-of-sight broadcast characteristics, operators with properly installed and functioning equipment may still receive incomplete FIS-B data when signal reception is limited by the distance from ground stations combined with a low altitude.

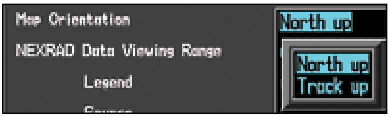
4.11.5 NEXRAD Weather Setup

1) While viewing the FIS-B weather page, press the **Menu** key.
2) With the Weather Setup selection highlighted, press **ENT**.

4.11.5.1 Weather Page Map Orientation

The Orientation option sets the orientation of the Wx Data Link Map pages.

1) While viewing the FIS-B Weather Map 1, 2, or 3 of the Wx page group, press the **MENU** key. With "Weather Setup" highlighted, press **ENT**.
2) With the "Map Orientation" option active, turn the small **MFD** knob to change the highlighted value.



Map Orientation North up

Figure 4-117 Weather Page Map Orientation

3) Press **ENT** to accept the displayed value. The next option will be highlighted.
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.11.5.2 NEXRAD Data Viewing Range

The NEXRAD Viewing Range option allows you to select the map range where at and below the selected value NEXRAD weather products will be shown on the selected MFD FIS-B Weather Map page (1, 2, or 3). When Off is selected, NEXRAD weather data will not be shown. Where a value (such as 250 NM) is selected, NEXRAD data will be shown at map ranges of that value (250 NM) and lower.

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**
2) The NEXRAD Data Viewing Range value will be highlighted. Turn the small **MFD** knob to highlight the desired value.
3) Press **ENT** to accept the displayed value. The next option will be highlighted.
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

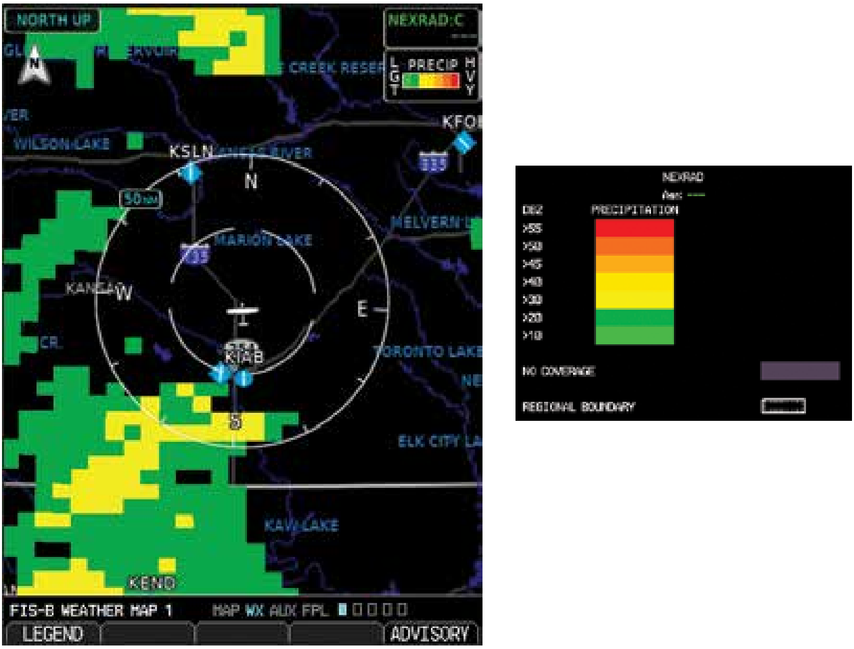

NORTH UP
NEXRAD:C
PRECIP
LGT
HVY
KFOE
WILSON LAKE
KSLN
SMOKY HILL RIVER
N
50NM
MELVERN L
MARION LAKE
KANSAS
W
E
KIAB
TORONTO LAKE
S
ELK CITY LA
KAW LAKE
KEND
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY
NEXRAD
Age: ---
PRECIPITATION
DBZ
>55
>50
>45
>40
>30
>20
>10
NO COVERAGE
REGIONAL BOUNDARY

Figure 4-118 FIS-B NEXRAD Precipitation and Legend

4.11.5.3 NEXRAD Legend

The NEXRAD Legend selection provides the option of displaying an abbreviated version of the NEXRAD legend in the top right region of the MFD. The full legend is available by pressing the **LEGEND** soft key.

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the NEXRAD Legend value.

3) Turn the small **MFD** knob to highlight Off or On. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.11.5.4 NEXRAD Source

Selecting NEXRAD in the FIS-B Weather Menu

1) While viewing the FIS-B weather page, press the **Menu** key.
2) With the Weather Setup selection highlighted, press **ENT**.
3) Turn the large **MFD** knob to highlight the NEXRAD Data Viewing Range Source option.
4) Turn the small **MFD** knob to select the desired Source option and press **ENT.**

Continental US NEXRAD (CONUS)

The Display CONUS NEXRAD selection shows NEXRAD radar information for the entire continental United States. CONUS NEXRAD data is updated every 15 minutes.

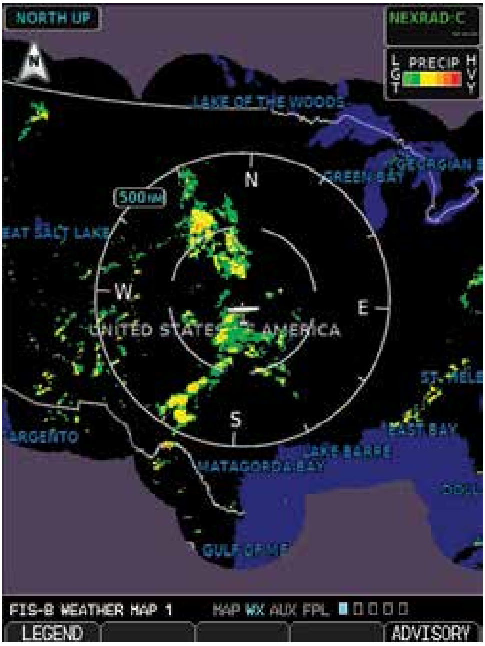

NORTH UP
NEXRAD-C
L G T
PRECIP
H V Y
LAKE OF THE WOODS
GREEN BAY
GEORGIAN B
500NM
N
EAT SALT LAKE
W
E
UNITED STATES OF AMERICA
S
ST. HELE
ARGENTO
EAST BAY
LAKE BARRE
MATAGORDA BAY
GULF OF ME
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

Figure 4-119 FIS-B CONUS NEXRAD

Regional NEXRAD

The Regional NEXRAD selection shows available regional NEXRAD radar information from reporting ground stations within 500 NM of the aircraft location.

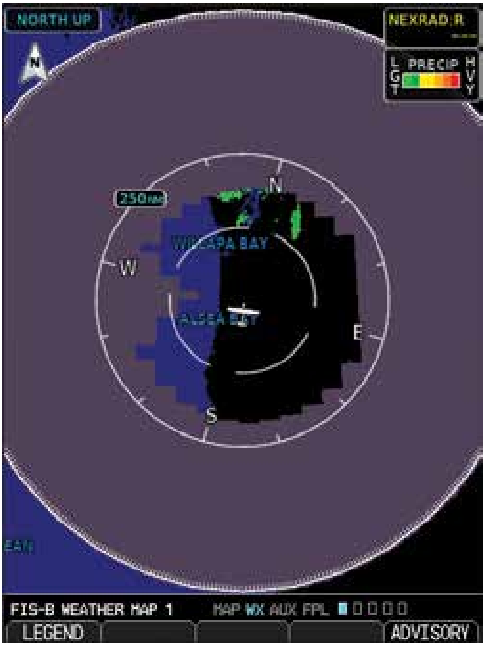

NORTH UP
N
NEXRAD R
L G T
PRECIP
H V Y
250NM
N
WILLAPA BAY
W
ALSEA BAY
E
S
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

Figure 4-120 FIS-B Regional NEXRAD

Combined NEXRAD

Regional NEXRAD data and CONUS NEXRAD data are shown together. The two types of NEXRAD are separated by a white stippled border. This boundary is updated whenever new Regional or CONUS NEXRAD data is received. The radius of the boundary is fixed at 150 NM.

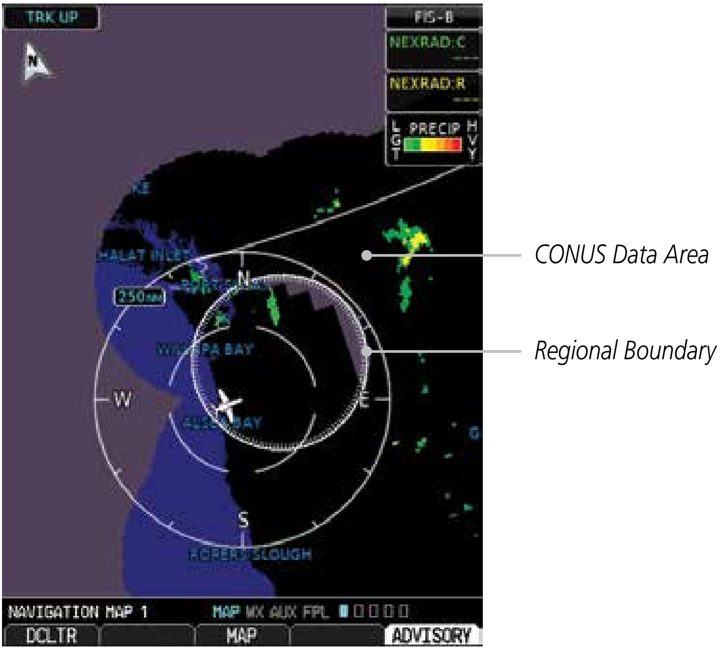
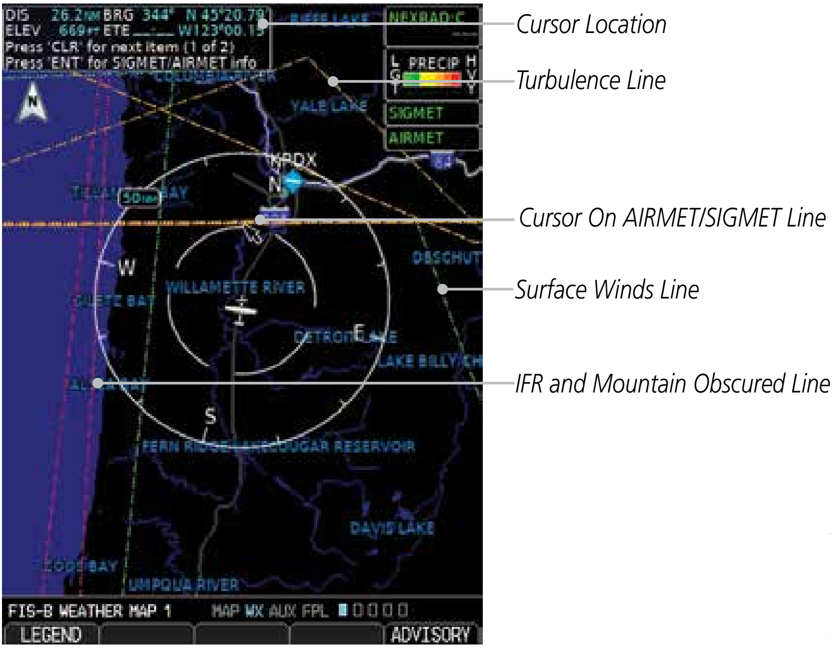

TRK UP
FIS-B
NEXRAD:C
NEXRAD:R
LGT PRECIP HVY
250NM
N
W
E
S
NAVIGATION MAP 1
MAP WX AUX FPL
DCLTR
MAP
ADVISORY
CONUS Data Area
Regional Boundary

Figure 4-121 FIS-B Combined NEXRAD

4.11.5.5 SIGMETs and AIRMETs (SIG/AIR)

SIGMETs (SIGnificant METeorological Information) and AIRMETs (AIRmen's METeorological Information) are broadcast for potentially hazardous weather considered of importance to aircraft. A Convective SIGMET is issued for hazardous convective weather. A localized SIGMET is a significant weather condition occurring at a localized geographical position.

When enabled, SIGMET/AIRMETs advise the pilot of potentially hazardous weather to all aircraft. SIGMET/AIRMET data covers icing, turbulence, dust, and volcanic ash as issued by the National Weather Service. The update rate is every 12 minutes.



DIS 26.2NM BRG 344° N 45°20.79'
ELEV 669FT ETE __:__ W123°00.15'
Press 'CLR' for next item (1 of 2)
Press 'ENT' for SIGMET/AIRMET info

Cursor Location
Turbulence Line
Cursor On AIRMET/SIGMET Line
Surface Winds Line
IFR and Mountain Obscured Line
NEXRAD:C
L PRECIP H
G Y
T Y
SIGMET
AIRMET
YALE LAKE
KPDX
50NM
W
S
WILLAMETTE RIVER
DETROIT LAKE
LAKE BILLY CH
FERN RIDGE LAKE
COUGAR RESERVOIR
DAVIS LAKE
COOS BAY
UMPQUA RIVER
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

Figure 4-122 FIS-B - AIRMETs/SIGMETs

SIGMET/AIRMET (SIG/AIR) Viewing Range

The SIGMET/AIRMET Viewing Range option allows you to select the map range where at and below that value SIGMET/AIRMET products will be shown on the selected MFD FIS-B Weather Map page (1, 2, or 3). When Off is selected, SIGMET/AIRMET will not be shown. For a value selected (such as, 150 NM), SIGMET/AIRMET data will be shown at map ranges of that value (150 NM), and lower.

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the SIG/AIR Viewing Range value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

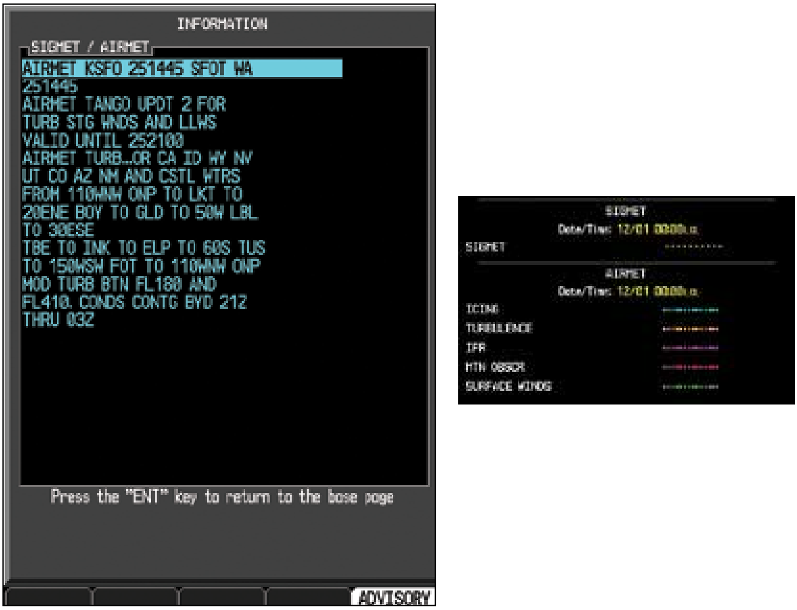
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Viewing Textual SIGMETs/AIRMETs

Textual SIGMET/AIRMETs can be viewed by selecting an SIGMET/AIRMET line on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a SIGMET/AIRMET line. Press **ENT**.

2) The Waypoint Information page for that line will now be shown. Press the **WX** soft key to view weather information.



INFORMATION

SIGMET / AIRMET

```
AIRMET KSFO 251445 SFOT WA
251445
AIRMET TANGO UPDT 2 FOR
TURB STG WNDS AND LLWS
VALID UNTIL 252100
AIRMET TURB...OR CA ID WY NV
UT CO AZ NM AND CSTL WTRS
FROM 110WNW ONP TO LKT TO
20ENE BOY TO GLD TO 50W LBL
TO 30ESE
TBE TO INK TO ELP TO 60S TUS
TO 150WSW FOT TO 110WNW ONP
MOD TURB BTN FL180 AND
FL410. CONDS CONTG BYD 212
THRU 032
```

Press the "ENT" key to return to the base page

SIGMET
Date/Time: 12/01 0000h.a
SIGMET

AIRMET
Date/Time: 12/01 0000h.a
ICING
TURBULENCE
IFR
MTN OBSCR
SURFACE WINDS

Figure 4-123 FIS-B AIRMETs/SIGMETs Detail and Legend

When enabled, the following AIRMETs are available for display:

- Icing
- Turbulence
- IFR conditions
- Mountain obscuration
- Surface winds

4.11.5.6 AIREP/PIREP

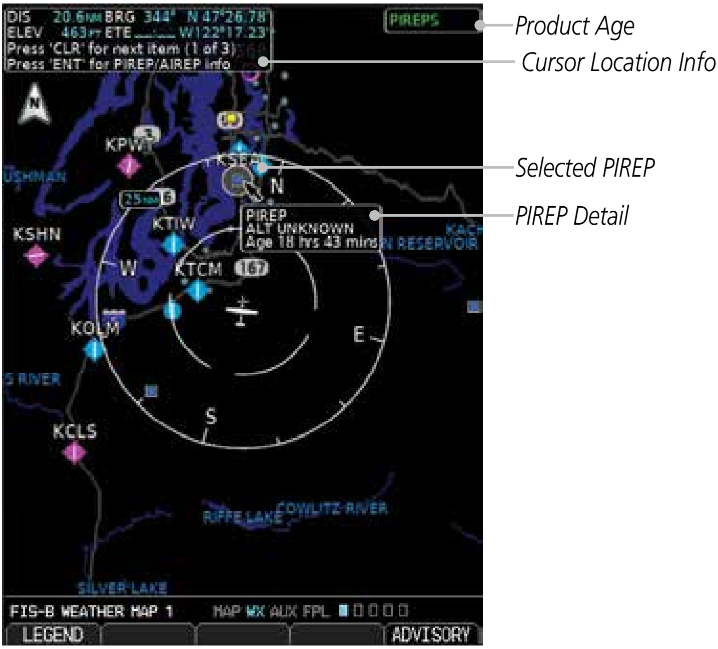
Pilot Weather Reports (PIREPs) provide timely weather information for a particular route of flight. When significant weather conditions are reported or forecast, Air Traffic Control (ATC) facilities are required to solicit PIREPs. A PIREP may contain non-forecast adverse weather conditions, such as low in-flight visibility, icing conditions, wind shear, and turbulence. PIREPs are issued as either Routine (UA) or Urgent (UUA).

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the PIREPS Viewing Range value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.



DIS 20.6NM BRG 344° N 47°26.78'
ELEV 463FT ETE ____ W122°17.23'
Press 'CLR' for next item (1 of 3)
Press 'ENT' for PIREP/AIREP info

PIREP
ALT UNKNOWN
Age 18 hrs 43 mins

PIREPS
Product Age
Cursor Location Info
Selected PIREP
PIREP Detail
KPWT
USHMAN
25NM
KSEA
N
KSHN
KTIW
KACH
RESERVOIR
W
KTCM
167
KOLM
E
S RIVER
S
KCLS
RIFFE LAKE
COWLITZ RIVER
SILVER LAKE
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

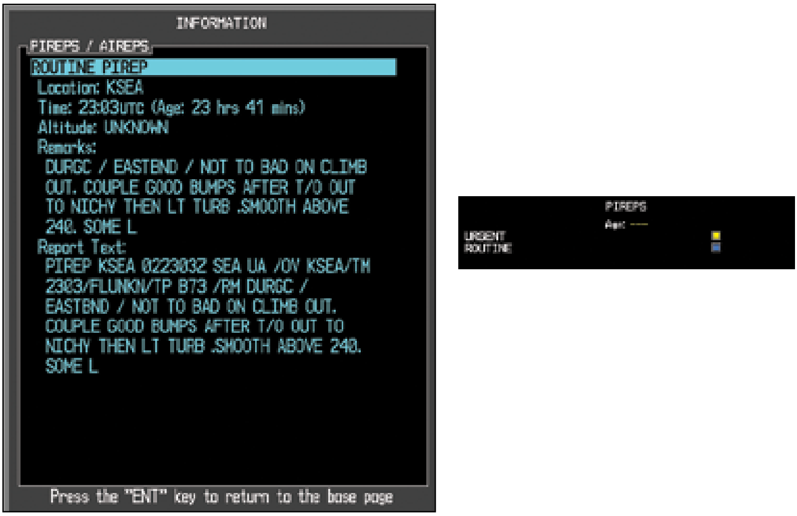
Figure 4-124 FIS-B AIREPs/PIREPs

Viewing Textual AIREPs/PIREPs

Textual AIREPs/PIREPs can be viewed by selecting an AIREP/PIREP on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a AIREP/PIREP. Press **ENT**.

2) Press **ENT** or the the small **MFD** knob to return to the Weather page.



INFORMATION

PIREPS / AIREPS

ROUTINE PIREP

Location: KSEA

Time: 23:03UTC (Age: 23 hrs 41 mins)

Altitude: UNKNOWN

Remarks:

DURGC / EASTBND / NOT TO BAD ON CLIMB OUT. COUPLE GOOD BUMPS AFTER T/O OUT TO NICHY THEN LT TURB .SMOOTH ABOVE 240. SOME L

Report Text:

PIREP KSEA 0223032 SEA UA /OV KSEA/TM 2303/FLUNKN/TP B73 /RM DURGC / EASTBND / NOT TO BAD ON CLIMB OUT. COUPLE GOOD BUMPS AFTER T/O OUT TO NICHY THEN LT TURB .SMOOTH ABOVE 240. SOME L

Press the "ENT" key to return to the base page

PIREPS

Age: ----

URGENT 🟨

ROUTINE 🟦

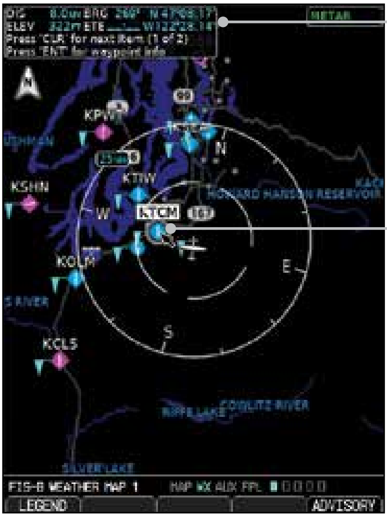
Figure 4-125 FIS-B AIREPs/PIREPs Detail and Legend

4.11.5.7 METARs

***NOTE:** Atmospheric pressure reported for METARs is given in hectopascals (hPa), except in the United States, where it is reported in inches of mercury (in Hg). Temperatures are reported in Celsius.*

***NOTE:** METAR information is only displayed within the installed aviation database service area.*

METAR (METeorological Aerodrome Report), known as an Aviation Routine Weather Report, is the standard format for current weather observations. METARs are updated hourly and are considered current. METARs typically contain information about the temperature, dew point, wind, precipitation, cloud cover, cloud heights, visibility, and barometric pressure. They can also contain information on precipitation amounts, lightning, and other critical data. METARs are shown as colored flags at airports that provide them.


DIS
ELEV
ETE
METAR
KPWT
KTIW
KSHN
KTCM
KOLM
KCLS
N
E
S
W
HOWARD HANSON RESERVOIR
COWLITZ RIVER
RIFFE LAKE
SILVER LAKE
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY
Cursor Location
Selected METAR (VFR)

Press 'CLR' for next item (1 of 2)
Press 'ENT' for waypoint info

Figure 4-126 FIS-B Weather - Graphic METARs

METAR Viewing Range

The METAR Viewing Range option allows you to select the map range where at and below that value METAR weather products will be shown on the selected MFD FIS-B Weather Map page (1, 2, or 3). When Off is selected, METARs will not be shown. For a value (such as 150 NM) selected, METAR data will be shown at map ranges of that value (150 NM), and lower.

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

2) Turn the large **MFD** knob to highlight the METAR Data Viewing Range value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

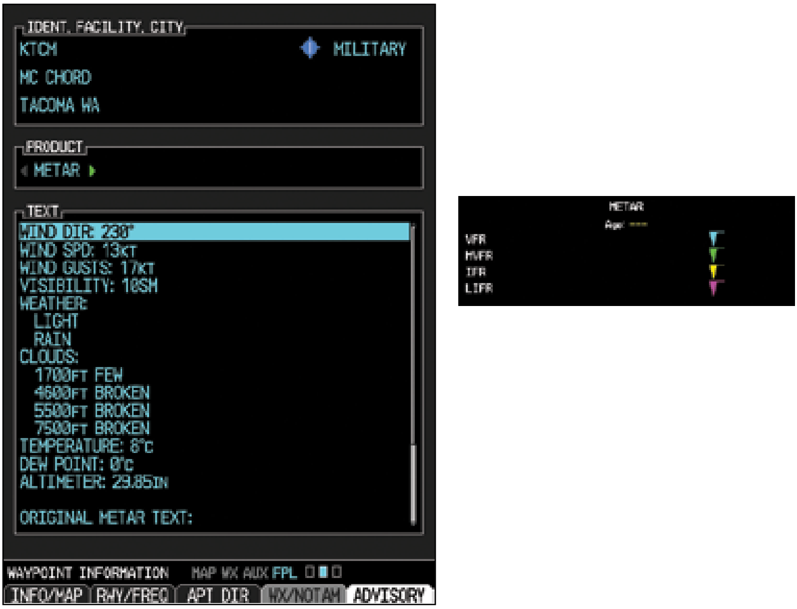
4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

Viewing Textual METARs

Textual METARs can be viewed by selecting an airport on the Map or Weather (WX) pages.

1) While viewing a Map or Weather page, Use the small and large **MFD** knobs to move the cursor to highlight an airport with a METAR flag. Press **ENT**.

2) The Waypoint Information page for that airport will now be shown. Press the **WX** soft key to view weather information for the waypoint.



IDENT, FACILITY, CITY
KTCM MILITARY
MC CHORD
TACOMA WA

PRODUCT
METAR

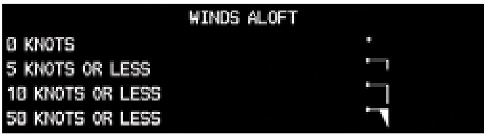
TEXT
WIND DIR: 230°
WIND SPD: 13KT
WIND GUSTS: 17KT
VISIBILITY: 10SM
WEATHER:
LIGHT
RAIN
CLOUDS:
1700FT FEW
4600FT BROKEN
5500FT BROKEN
7500FT BROKEN
TEMPERATURE: 8°C
DEW POINT: 0°C
ALTIMETER: 29.85IN

ORIGINAL METAR TEXT:

Figure 4-127 FIS-B Weather - Textual METARs

4.11.5.8 Winds Aloft

Winds Aloft data shows the forecast wind speed and direction at the surface and at selected altitudes. Altitudes can be selected in 3000 foot increments from the surface up to 42,000 feet MSL by pressing the **WX Alt Dn** or **WX Alt Up** soft keys.



WINDS ALOFT
0 KNOTS
5 KNOTS OR LESS
10 KNOTS OR LESS
50 KNOTS OR LESS

Figure 4-128 FIS-B Weather - Winds Aloft Legend

The Winds Aloft Data Viewing Range option allows you to select the map range where at and below that value Winds Aloft weather products will appear on the selected MFD FIS-B Weather Map page (1, 2, or 3). When Off is selected, Winds Aloft will not be shown. For the value (such as 150 NM) selected, Winds Aloft data will be shown at map ranges of that value (such as 150 NM), and lower.

1) While viewing a FIS-B Weather Map page of the WX page group, press the **MENU** key to display the Page Menu Options. The cursor flashes on the "Weather Setup" option. Press **ENT.**

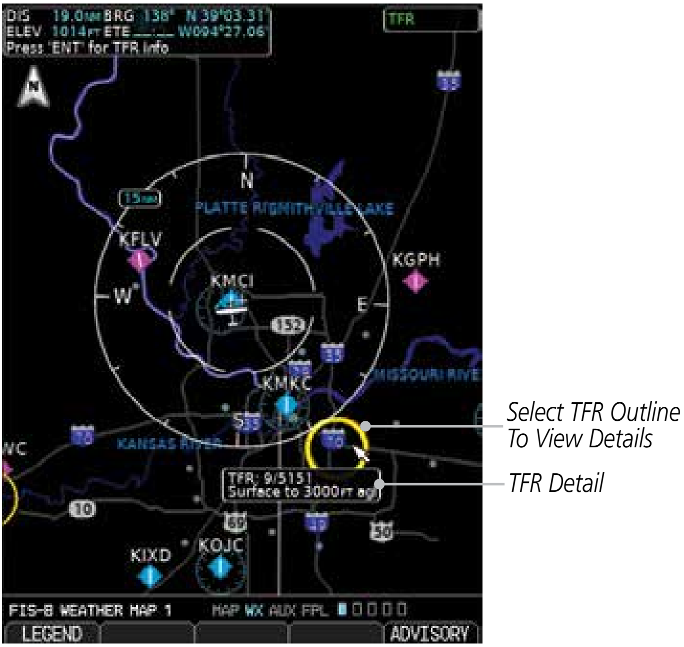
2) Turn the large **MFD** knob to highlight the Winds Aloft Data Viewing Range value.

3) Turn the small **MFD** knob to highlight the desired value. Press **ENT** to accept the displayed value. The next option will be highlighted.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the Navigation Map page or turn the large **MFD** knob to the next option.

4.11.5.9 FIS-B TFRs

Temporary Flight Restrictions (TFRs) provide detailed information for local short term restrictions.



DIS 19.0NM BRG 138° N 39°03.31'
ELEV 1014FT ETE __:__ W094°27.06'
Press 'ENT' for TFR info

TFR: 9/5151
Surface to 3000FT agl

TFR
N
15NM
PLATTE R
SMITHVILLE LAKE
KFLV
KGPH
KMCI
W
E
152
35
29
MISSOURI RIVE
KMKC
WC
KANSAS RIVER
35
70
10
69
49
50
KIXD
KOJC
FIS-B WEATHER MAP 1
MAP WX AUX FPL
LEGEND
ADVISORY

Select TFR Outline To View Details

TFR Detail

Figure 4-129 FIS-B Weather - TFRs

The Temporary Flight Restriction (TFR) viewing range option selects whether TFR information is shown on the FIS-B Weather Map. TFR information will be shown at and below the selected map range. When Off is selected, the information will not be shown. For the value (such as 500 NM) selected, TFR information will be shown at map ranges of that value (500 NM), and lower.

1) While viewing a FIS-B Weather Map page of the WX page group, turn the large **MFD** knob to highlight the TFR Data Viewing Range option.

2) Turn the small **MFD** knob to change the highlighted value.

3) Press **ENT** to accept the displayed value.

4) Press the small **MFD** knob to cancel selection or to end editing and return to the FIS-B Weather Map page.

Viewing Textual TFRs

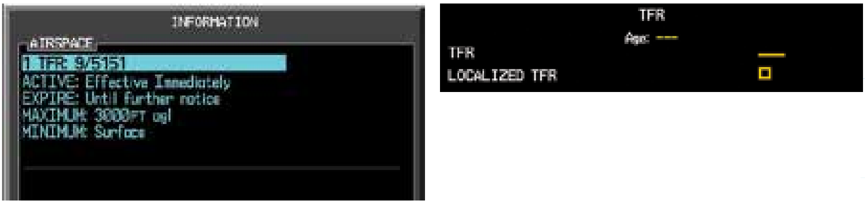
Textual TFRs can be viewed by selecting a TFR outline on the Weather (WX) pages.

1) While viewing a Weather page, Use the small and large **MFD** knobs to move the cursor to highlight a TFR outline (yellow circle). Press **ENT**.

2) A summary of the TFR will be shown and the first TFR will be highlighted. In the case of multiple TFRs, turn the small or large **MFD** knobs to highlight the desired TFR.

3) Press the **VIEW TEXT** soft key to view the full TFR text.

4) Press **ENT** to return to the Weather page.



1 TFR: 9/5151
ACTIVE: Effective Immediately
EXPIRE: Until further notice
MAXIMUM: 3000FT agl
MINIMUM: Surface

Figure 4-123 FIS-B Weather - Textual TFRs and Legend

4.11.6 FIS-B Product Times

The weather product expiration time is shown in the following table. It does not represent the rate at which weather data is updated or new content is received by the Data Link Receiver.

Weather Product	Expiration Time (Minutes)
CONUS NEXRAD	60
SIGMETs / AIRMETs	60
METARs	90
Winds Aloft	90
PIREPS	90
NOTAMs/TFRs	60

Table 4-27 FIS-B Weather Data Timing

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

4.12 Stormscope

***NOTE:** Refer to the WX-500 Pilot's Guide for a detailed description of the WX-500 StormScope.*

The WX-500 StormScope Weather Mapping Sensor is a passive weather avoidance system that detects electrical discharges associated with thunderstorms within a 200 NM radius of the aircraft. StormScope measures relative bearing and distance of thunderstorm-related electrical activity and reports the information to the display. ***Interfaces are currently only available for the WX-500 StormScope System***.

For lightning display interpretation, study the examples in the WX-500 Pilot's Guide that are designed to help you relate the cell or strike patterns shown on the display to the size and location of thunderstorms that may be near your aircraft.

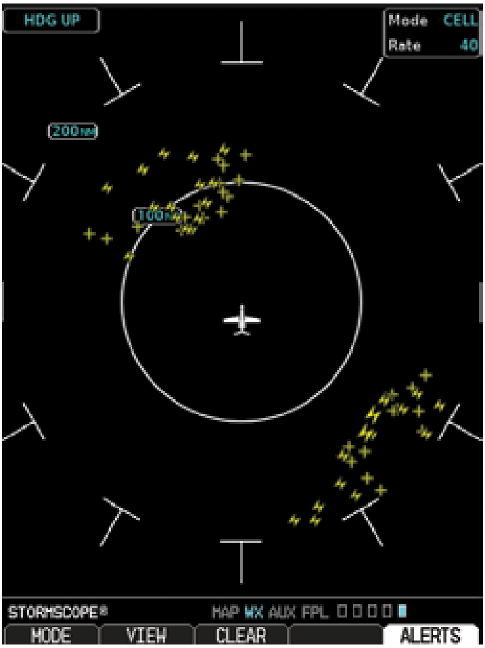


Figure 4-124 Stormscope

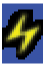
Symbol	Time Since Strike (Seconds)
	Less than 6
	Less than 60
	Less than 120
	Less than 180

Table 4-28 Stormscope Symbols

Mode

The Mode selection allows you to select the display of storm cells or strikes.

> ***NOTE****: Cell mode uses a clustering program to identify clusters of electrical activity that indicate cells. Cell mode is most useful during periods of heavy storm activity. Displaying cell data during these periods frees the user from sifting through a screen full of discharge points and helps to better determine where the storm cells are located.*

View

The Mode selection allows you to select 360° or Arc views.

Clearing the StormScope® Page

Routinely clearing the StormScope Page of all discharge points is a good way to determine if a storm is building or dissipating. In a building storm discharge points reappear faster and in larger numbers. In a dissipating storm discharge points appear slower and in smaller numbers.

1) While viewing the Weather StormScope page, press the **Clear** key to clear lightning strikes.

2) Lightning strikes will be cleared from the display and the Rate value will be reset.

> ***NOTE****: When Heading is not available (N/A), the pilot must clear the strikes after each turn.*

This page intentionally left blank

5 ADDITIONAL FEATURES (OPTIONAL)

***NOTE:** The availability of SafeTaxi, ChartView, or FliteCharts in electronic form may not preclude the requirement to carry paper charts aboard the aircraft. See the AFMS for more information.*

***NOTE:** ChartView is an optional feature that requires enablement by a Garmin dealer.*

Additional features of the GDU 620 include the following:

- ChartView and FliteCharts® electronic charts
- SafeTaxi® diagrams
- Sirius XM Satellite Radio entertainment
- XM WX Satellite Weather (covered in Section 4.7)
- Traffic (covered in Sections 4.5 and 4.6)
- Synthetic Vision Technology (SVT™)

The optional ChartView and FliteCharts provide on-board electronic terminal procedures charts. Electronic charts offer the convenience of rapid access to essential information. Either ChartView or FliteCharts may be configured in the system.

SafeTaxi diagrams provide detailed taxiway, runway, and ramp information at more than 700 airports in the United States. By decreasing the range on an airport that has a SafeTaxi diagram available, a close up view of the airport layout can be seen.

The optional Sirius XM Satellite Radio entertainment audio feature of the GDL 69A Data Link Receiver handles more than 170 channels of music, news, and sports. Sirius XM Satellite Radio offers more entertainment choices and longer range coverage than commercial broadcast stations.

XM WX Satellite Weather is an optional service that provides the ability to display graphic weather data overlaid on the MFD Nav Map and Weather Data Link pages.

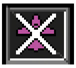
The Traffic Map Page shows surrounding TAS or TIS traffic data in relation to the aircraft's current position and altitude. The Traffic option is designed to assist in detection and avoidance of other aircraft.

The optional Synthetic Vision Technology (SVT™) is a visual enhancement to the G500/600. SVT is displayed as a forward-looking display of the topography immediately in front of the aircraft. SVT information is shown on the primary flight display (PFD).

5.1 Viewing FliteCharts and ChartView

When the Chart function is available, charts will be shown on the third page of the Flight Plan page group. The chart page will default to the nearest airport if no flight plan or destination airport is present. While you are on the ground, the displayed charts will default to the current airport location regardless of flight plan.

Both ChartView and FliteCharts may be geo-referenced. The icon will have an "x" through it the selected chart does not support geo-referencing.



***NOTE:** The availability of SafeTaxi, ChartView, or FliteCharts in electronic form may not preclude the requirement to carry paper charts aboard the aircraft. See the AFMS for more information.*

***NOTE:** The Chart feature provides a digital representation of a paper chart and provides no vertical or lateral course guidance. Flight Plan and Procedures are separate from Charts, and do provide vertical and lateral course guidance for the loaded route or procedure shown on the Flight Plan page. The term "Chart Unavailable" means that the chart cannot be viewed on the Charts due to either a chart not being published, or an error in the Chart database, but does not preclude its availability or inclusion of the procedure in the Flight Plan or Procedures portion of the system. The absence of a chart for a particular Departure, Arrival, or Approach does not preclude its availability or inclusion in the Flight Plan. The absence of a particular Departure, Arrival, or Approach under the Flight Plan does not preclude the ability to view the Chart.*

***NOTE**: Do not use SafeTaxi or Chartview functions as the basis for ground maneuvering. SafeTaxi and Chartview functions do not comply with the requirements of AC 20-159 and are not qualified to be used as an airport moving map display (AMMD). SafeTaxi and Chartview are to be used by the flight crew to orient themselves on the airport surface to improve pilot situational awareness during ground operations.*

***NOTE:** The chart for the destination airport or loaded approach will automatically be selected.*

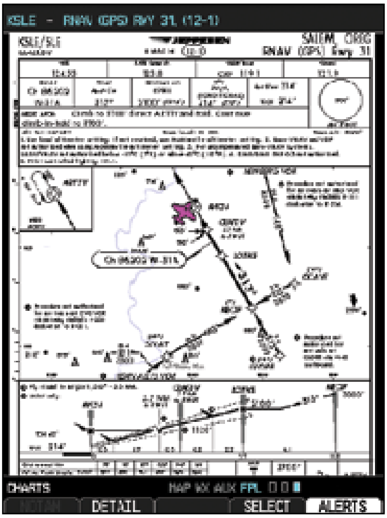

KSLE - RNAV (GPS) RWY 31 (12-1)
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ALERTS

Figure 5-1 ChartView Chart Page

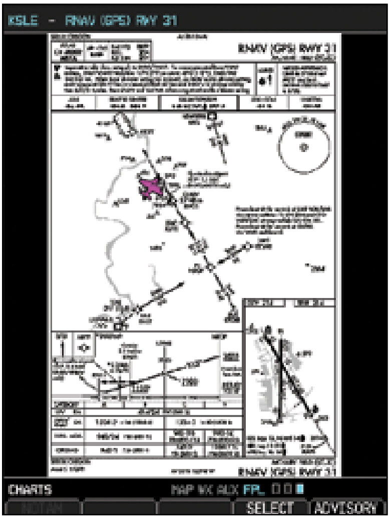

KSLE - RNAV (GPS) RWY 31
CHARTS
MAP WX AUX FPL
NOTAM
SELECT
ADVISORY

Figure 5-2 FliteChart Chart Page

1) Turn the large **MFD** knob to the Flight Plan (FPL) page group.

2) Turn the small **MFD** knob to the Charts page.

5.1.1 ChartView (Optional)

ChartView resembles the paper version of Jeppesen terminal procedures charts. The charts are displayed in full color with high-resolution. The MFD depiction shows the aircraft position on the moving map in the plan view of approach charts and on airport diagrams.

The ChartView database subscription is available from Jeppesen, Inc. ChartView is an optional feature that requires enablement by a Garmin dealer. Available data includes:

- Arrivals (STAR)
- Departure Procedures (DP)
- Approaches
- Airport Diagrams
- Chart NOTAMs

Cycle Number and Revision

The ChartView database is revised every 14 days. Charts are still viewable during a period that extends from the cycle expiration date to the disables date. ChartView is disabled 70 days after the expiration date and is no longer available for viewing upon reaching the disable date. When turning on the GDU 620, the Power-up Page indicates any of nine different possible criteria for ChartView availability. See the table below for the various ChartView Power-up Page displays and the definition of each.

5.1.2 FliteCharts®

FliteCharts® resemble the paper version of FAA-published terminal procedures charts. FliteChart data may also be provided by sources other than the FAA. The charts are displayed with high-resolution and in color for applicable charts. The MFD FliteCharts depiction shows the aircraft position on the moving map in the plan view of approach charts.

FliteCharts database subscription is available from Garmin. Available data includes:

- Arrivals (STAR)
- Departure Procedures (DP)
- Approaches
- Airport Diagrams (not geo-referenced)

Cycle Number and Revision

FliteCharts data is revised every 28 days. Charts are still viewable during a period that extends from the cycle expiration date to the disables date. FliteCharts is disabled 180 days after the expiration date and are no longer available for viewing upon reaching the disables date. When turning on the GDU 620, the Power-up page indicates any of five different possible criteria for chart availability. These indications are whether the databases are not configured, not available, current, out of date, or disabled. See the previous table for the various FliteCharts Power-up page displays and the definition of each.

5.1.3 Determining Chart Database Type, Coverage, and Currency

Chart Database Type

Select the **DBASE** soft key for scrolling through the database information. Scroll through the database with the **MFD** knob or **ENT** key.

1) Turn the large **MFD** knob to select AUX.

2) Press the **DB ACTV** key to view the databases.

3) Press the small **MFD** knob and then turn the small or large **MFD** knobs to highlight Chart Type. The field will show Not Available, ChartView, or FliteCharts.

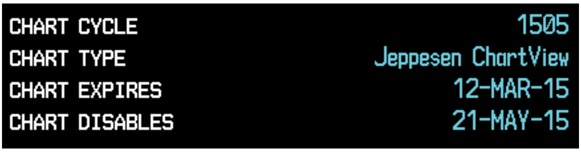


CHART CYCLE 1505
CHART TYPE Jeppesen ChartView
CHART EXPIRES 12-MAR-15
CHART DISABLES 21-MAY-15

Figure 5-3 ChartView Database Information

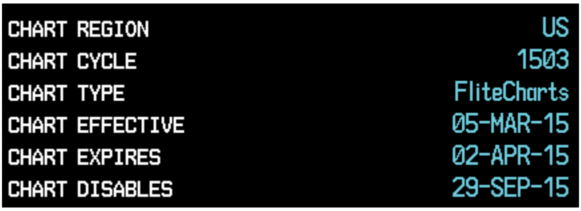


CHART REGION US
CHART CYCLE 1503
CHART TYPE FliteCharts
CHART EFFECTIVE 05-MAR-15
CHART EXPIRES 02-APR-15
CHART DISABLES 29-SEP-15

Figure 5-4 FliteChart Database Information

Chart Coverage

The Chart databases cover the area that was selecting during the download process. FliteCharts will note the region covered by the installed chart database; ChartView does not.

Chart Currency

The date currency of the installed chart databases are shown both during power-up and on the AUX - System Status page.

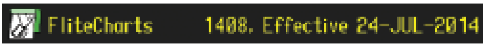
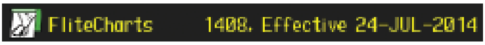
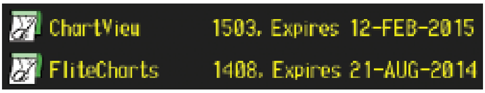
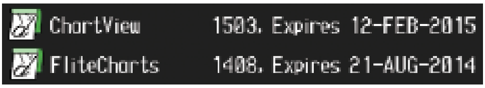
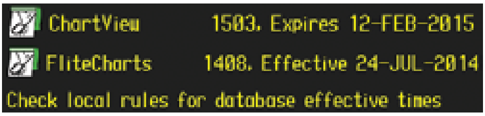
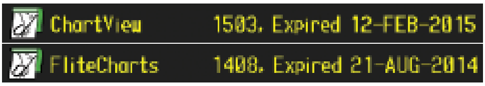
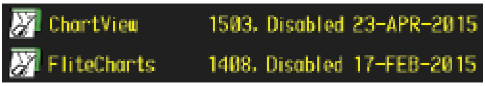
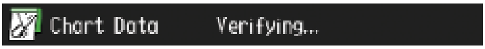
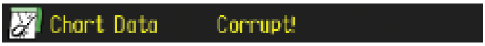
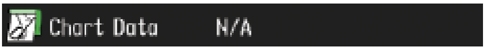
Power-up Page Display	Definition
 FliteCharts 1408, Effective 24-JUL-2014	Database's effective date is in the future. [2]
 FliteCharts 1408, Effective 24-JUL-2014	Database's effective date is the current day. [1] [2]
 ChartView 1503, Expires 12-FEB-2015 FliteCharts 1408, Expires 21-AUG-2014	Current date is unknown (e.g., no GPS fix yet).
 ChartView 1503, Expires 12-FEB-2015 FliteCharts 1408, Expires 21-AUG-2014	Database is active.
 ChartView 1503, Expires 12-FEB-2015 FliteCharts 1408, Effective 24-JUL-2014 Check local rules for database effective times	Database's expiration date is the current day. [1]
 ChartView 1503, Expired 12-FEB-2015 FliteCharts 1408, Expired 21-AUG-2014	Database's expiration date has passed. Expired notes that the database expired less than 70 days ago, but may still be used.
 ChartView 1503, Disabled 23-APR-2015 FliteCharts 1408, Disabled 17-FEB-2015	Database's disable data has passed. Disabled notes that the database expired more than 70 days ago and is no longer available for use.
 Chart Data Verifying...	System is verifying database when new cycle is installed.
 Chart Data Corrupt!	Database verification failed.
 Chart Data N/A	No database is installed.
	Blank Line. GDU 620 system is not configured for any chart data. Contact a Garmin-authorized service center for configuration.

Table 5-1 Power-up Page Annunciations and Definitions

1. When the effective or expiration date is the current day, the following message is displayed at the bottom of the page: "Check local rules for database effective times."
2. ChartView does not have "Effective" dates.

5.1.4 Selecting a Chart

The G500/600 will only allow the pilot to select the chart type in normal mode if it is configured for ChartView. When in-air, the pilot cannot select the field to change the chart source, and a small message is displayed underneath the Chart Type line that reads "Chart Type can only be changed when on ground". The ability to select a chart type is absent from normal mode if configured for FliteCharts.

5.1.4.1 Selecting FliteCharts or ChartView

When configured during installation and when both chart types are available, you can select which chart type will be used. Only one chart type can be used at a time.

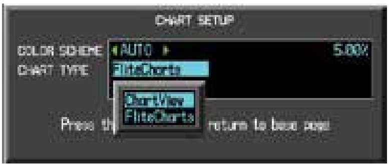


CHART SETUP

COLOR SCHEME AUTO 5.00%

CHART TYPE FliteCharts

ChartView
FliteCharts

Press th… return to base page

Figure 5-5 Chart NOTAM

1) Turn the large **MFD** knob to highlight the Chart Type sections.
2) Turn the small **MFD** knob to select ChartView or FliteCharts.
3) Press the **ENT** key to save the selected value.
4) Changing chart type requires a restart of the unit. With OK selected, press the **ENT** key to restart the unit and change to the selected chart type.

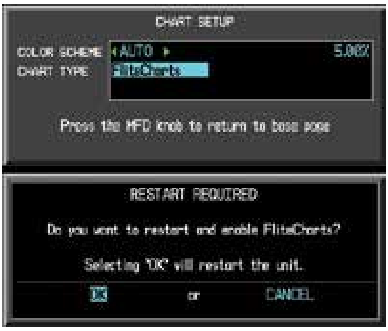


CHART SETUP

COLOR SCHEME AUTO 5.00%

CHART TYPE FliteCharts

Press the MFD knob to return to base page

RESTART REQUIRED

Do you want to restart and enable FliteCharts?

Selecting 'OK' will restart the unit.

OK or CANCEL

Figure 5-6 Changing Chart Type

5.1.4.2 Selecting a New Chart by FPL, NRST, or RECENT

You may select other charts to display based on your flight plan (FPL), charts of the nearest airport (NRST), or your most recently selected airports (RECENT).

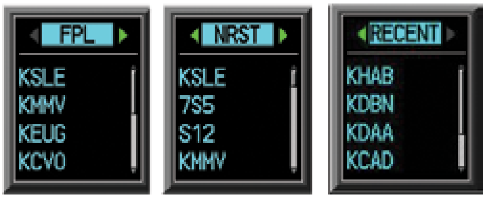

FPL
KSLE
KMMV
KEUG
KCVO
NRST
KSLE
7S5
S12
KMMV
RECENT
KHAB
KDBN
KDAA
KCAD

Figure 5-7 Chart Category Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key.

2) Turn the small **MFD** knob counterclockwise to show FPL, NRST, or RECENT.

3) Turn the large **MFD** knob to select the desired identifier and then press **ENT**.

5.1.4.3 Selecting a Chart Manually

A chart for a different airport may be chosen by selecting the identifier for the desired airport.

Airport Identifier Selection

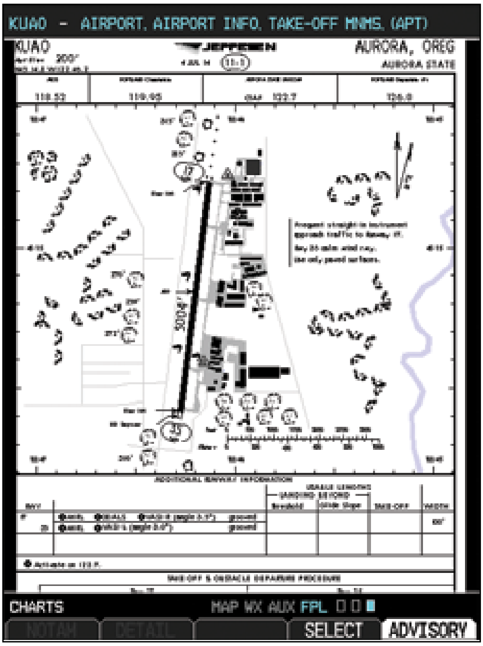

KUAO - AIRPORT, AIRPORT INFO, TAKE-OFF MNMS, (APT)
KUAO
JEPPESEN
AURORA, OREG
AURORA STATE
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ADVISORY

Figure 5-8 Airport Identifier Selection

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key to change the airport.
2) Use the small **MFD** knob to change the character.
3) Use the large **MFD** knob to move the cursor to highlight a character.
4) Press **ENT** to accept the selected airport.

5.1.4.4 Chart Auto-Selection

The charts page will automatically select a chart to display when the page is opened.

***NOTE:** The chart for the destination airport or loaded approach will automatically be selected.*

- While on the ground, the nearest airport diagram will be displayed.
- If an approach is loaded in the selected GPS navigator, the chart for that approach will be displayed. In some cases, the pilot may be prompted to select the correct chart from a list of possible matches.
- If an approach is not loaded, the airport diagram for the destination airport will be displayed.
- If no destination airport exists, the nearest airport diagram will be displayed.

***NOTE:** Automatic chart selection only occurs when the charts page is opened. For example, if a new approach is loaded while the charts page is open, a different MFD page must be selected and the charts page re-opened for the new approach chart to be automatically displayed.*

When the pilot has manually selected a chart to display, a different chart will not be automatically selected until one of the following events occurs:

- The aircraft takes off or lands
- A new or different approach is loaded

1) While viewing the Charts page of the FPL page group, press the **SELECT** soft key to activate chart selection.
2) Turn the large **MFD** knob to highlight the field to the right of the airport identifier.

3) Turn the small **MFD** knob to highlight the desired chart.

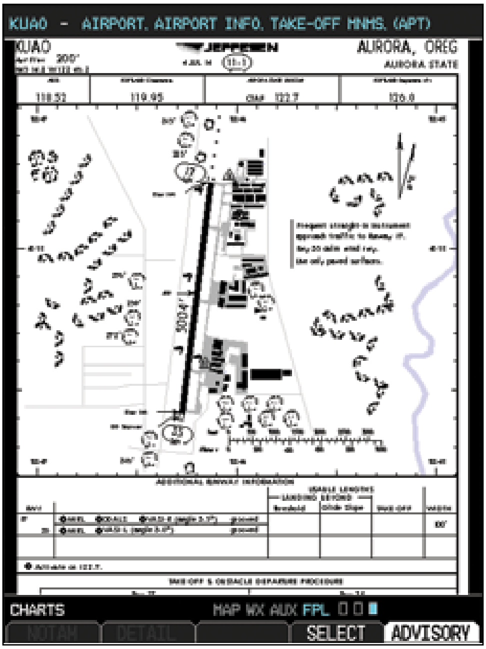

KUAO - AIRPORT, AIRPORT INFO, TAKE-OFF MNMS, (APT)
KUAO
JEPPESEN
AURORA, OREG
AURORA STATE
118.53
119.95
CTAF 122.7
126.0
3004'
ADDITIONAL RUNWAY INFORMATION
TAKE-OFF & OBSTACLE DEPARTURE PROCEDURE
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ADVISORY

Figure 5-9 Activate Chart Selection for the Current Airport (ChartView shown)

4) Press **ENT** to accept and view the selected chart.

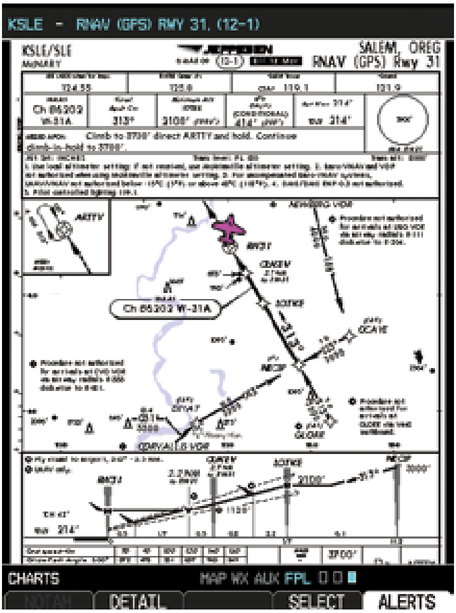

KSLE - RNAV (GPS) RWY 31, (12-1)
KSLE/SLE
SALEM, OREG
RNAV (GPS) Rwy 31
Ch 86202 W-31A
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ALERTS

Figure 5-10 Selected Chart for the Current Airport (ChartView shown)

5.1.5 Using Charts

More detail on the displayed chart can be viewed by zooming in with the Range keys and moving the chart around with pan mode. The Detail soft key allows access to more details for the currently displayed chart.

5.1.5.1 Chart Zooming and Panning

Chart and Panning allows viewing charts closer to examine details.

***NOTE:** Panning mode is indicated by the presence of scroll bars.*

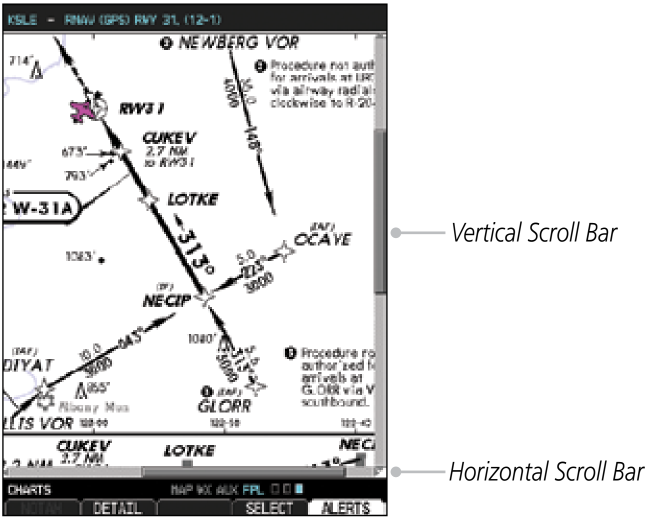

KSLE - RNAV (GPS) RWY 31 (12-1)
NEWBERG VOR
RW31
CUKEV
LOTKE
W-31A
OCAVE
NECIP
DIYAT
GLORR
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ALERTS
Vertical Scroll Bar
Horizontal Scroll Bar

Figure 5-11 Zooming and Panning Around a Chart

1) While viewing the Charts page of the FPL page group, press the **RNG** (Range) ▲ ▼ keys to zoom in and out.

2) After zooming in, you may only see part of the chart. Press the small **MFD** knob to enter Pan mode and activate scroll bars on the edges of the chart. Turn the large and small **MFD** knobs to move around the chart.

3) Press the small **MFD** knob to cancel the scroll bars and exit panning.

5.1.5.2 Viewing Chart Details in ChartView

NOTE: *The chart for the destination airport or loaded approach will automatically be selected.*

NOTE: *Chart details are only available for instrument approach procedure charts. Chart details are not available for airport diagrams or SID/STAR charts.*

1) Press the **Detail** key to view detailed views of the current chart. The **Detail** key is only available with ChartView.

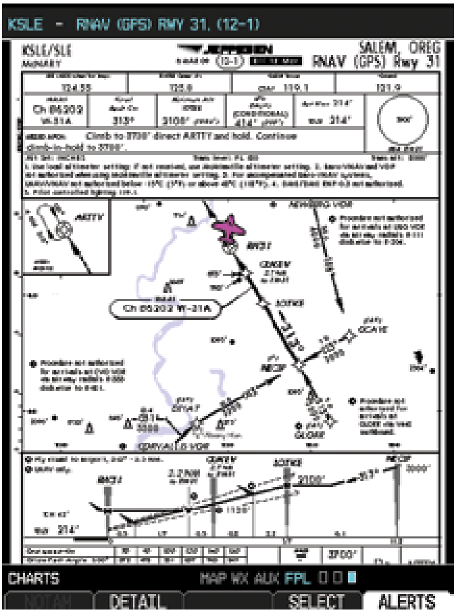

KSLE - RNAV (GPS) RWY 31, (12-1)
KSLE/SLE
SALEM, OREG
RNAV (GPS) Rwy 31
CHARTS
MAP WX AUX FPL
NOTAM
DETAIL
SELECT
ALERTS

Figure 5-12 Selected Chart for the Current Airport (ChartView shown)

2) Press the **Header**, **Plan**, **Profile**, or **Minimums** keys to view detailed sections for the chart for those topics. An aircraft icon will show in the lower right corner of the display if your aircraft is in the chart area.

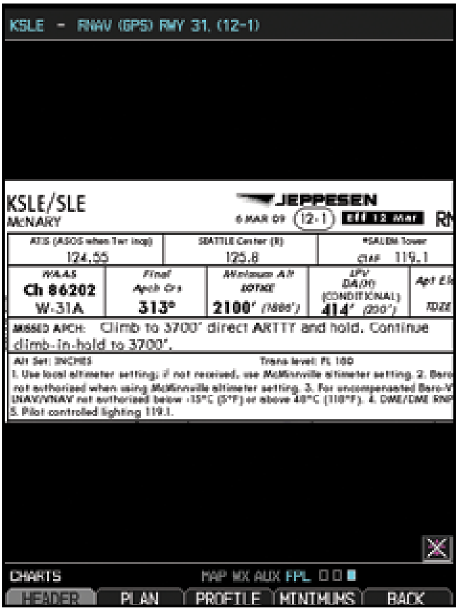

KSLE - RNAV (GPS) RWY 31 (12-1)
KSLE/SLE
McNARY
JEPPESEN
12-1
124.55
125.8
119.1
Ch 86202
W-31A
313°
2100'
414'
CHARTS
MAP WX AUX FPL
HEADER
PLAN
PROFILE
MINIMUMS
BACK

Figure 5-13 Detail of the Selected Chart (Header Shown)

3) Press the **Back** key to return to the view of the full chart.

5.1.5.3 Setting the Altitude Minimums Alerter

1) While viewing the Charts Page of the FPL page group, press the **Menu** key. With the Set Minimums item highlighted, press **ENT.**

2) With the Minimums Source highlighted, select the Altitude Minimums Alerter source with small **MFD** knob.

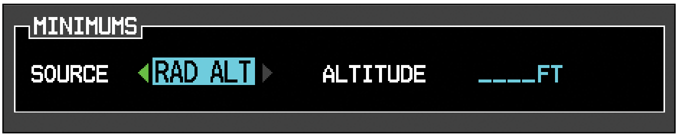

MINIMUMS
SOURCE RAD ALT ALTITUDE _____FT

Figure 5-14 Minimums Source Selection

3) Turn the large **MFD** knob to highlight the Altitude Minimums value. Turn the large and small **MFD** knobs to change the Altitude Minimums value and then press **ENT** to activate the selected value.

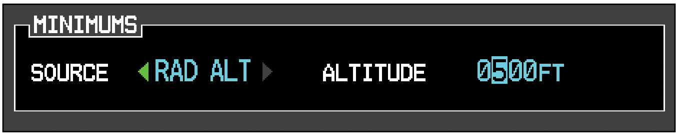

MINIMUMS
SOURCE RAD ALT ALTITUDE 0500FT

Figure 5-15 Minimums Altitude Selection

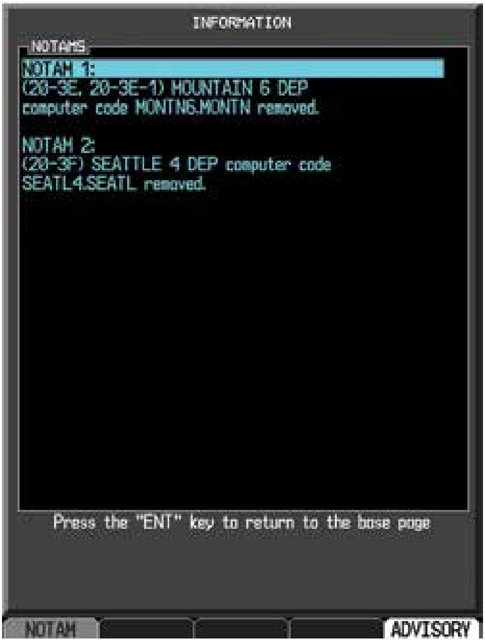
Alerting is inhibited while the aircraft is on the ground and until the aircraft reaches 150 feet above the MDA. The Minimum altitude will be available in the Altitude Alerter.

In dual installations, the minimums alerting altitude value may be set from either GDU 620 and will be synchronized on both units.

***NOTE:** If you highlight the Minimums Altitude field on the FPL page and press the CLR key, it will turn the minimums functionality off.*

5.1.5.4 Viewing Chart NOTAMs

If an active NOTAM (Notice to Airmen) exists for the selected chart, the **NOTAM** soft key will be available. Press the **NOTAM** soft key to view the NOTAM or select View NOTAMs from the Chart Options Menu.



NOTAM 1:
(20-3E, 20-3E-1) MOUNTAIN 6 DEP
computer code MONTN6.MONTN removed.

NOTAM 2:
(20-3F) SEATTLE 4 DEP computer code
SEATL4.SEATL removed.

Press the "ENT" key to return to the base page

Figure 5-16 Chart NOTAM

5.1.5.5 Day/Night View

The Chart pages can be displayed on a white or black background for day or night viewing. The Day View offers a better presentation in a bright environment. The Night View gives a better presentation for viewing in a dark environment. .

When AUTO is selected, it allows the user to set a threshold for the transition between the Day and Night color schemes.

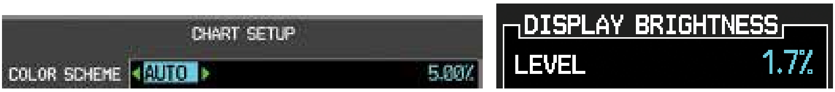


CHART SETUP
COLOR SCHEME AUTO 5.00%

DISPLAY BRIGHTNESS
LEVEL 1.7%

Figure 5-17 Chart Color Scheme Auto Selection and Aux Display Brightness

The threshold is compared to the Display Brightness Level that is displayed on the Aux System Setup page. If the color scheme percentage on the Chart Setup page is less than the display brightness percentage selected on the Aux System Setup page, then the Chart AUTO Color Scheme will draw the chart as though the NIGHT scheme were selected. Otherwise, the AUTO scheme will draw the chart as though the DAY scheme were selected.

1) In the FPL page group, turn the small **MFD** knob to reach the Charts page.
2) Press **MENU** to display the Options menu.
3) Press **ENT** to go to Chart Setup. The Color Scheme option will be highlighted.
4) Turn the small **MFD** knob to select Day - AUTO - Night.
5) If Auto is selected, turn the large **MFD** knob CW to the percentage value and turn the small **MFD** knob to change the value.
6) Press the small **MFD** knob or the **ENT** key to save the selected value and return to the Charts page.

***NOTE:** Once an adjustment is made to the percentage field in Auto mode, the chart must be redrawn (zoomed in or out, or another chart selected) before the switch from Day to Night is seen.*

5.2 SafeTaxi®

SafeTaxi® is an enhanced feature that gives greater map detail when zooming in on airports at close range. The airport display on the map reveals runways with numbers, taxiways with identifying letters/numbers, airport Hot Spots, and airport landmarks including ramps, buildings, control towers, and other prominent features. Resolution is greater at lower map ranges. When the aircraft location is within the screen boundary, including within SafeTaxi ranges, an aircraft symbol is shown on any of the navigation map views for enhanced position awareness.

Designated Hot Spots are recognized at airports with many intersecting taxiways and runways, and/or complex ramp areas. Airport Hot Spots are outlined to caution pilots of areas on an airport surface where positional awareness confusion or runway incursions happen most often. Hot Spots are defined with a magenta circle or outline around the region of possible confusion.

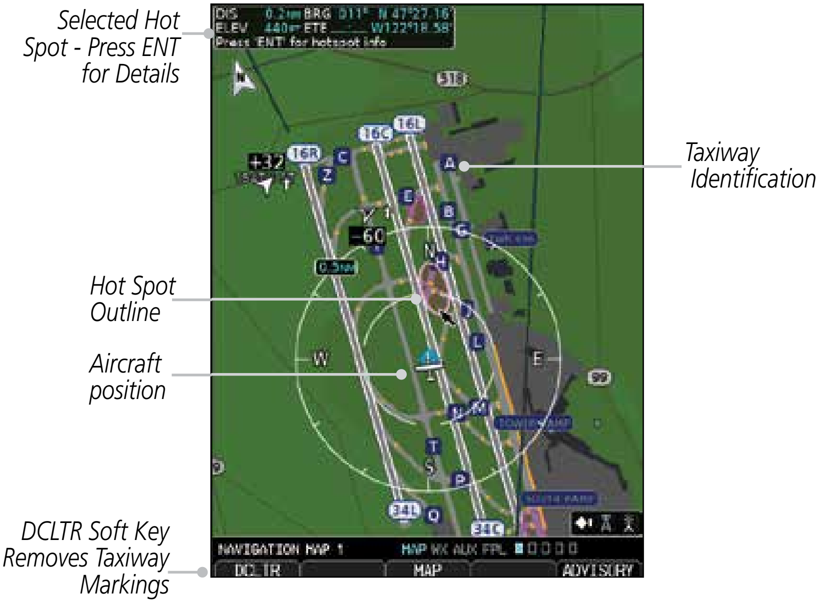

Selected Hot Spot - Press ENT for Details
Taxiway Identification
Hot Spot Outline
Aircraft position
DCLTR Soft Key Removes Taxiway Markings
DIS 0.2nm BRG 011° N 47°27.16'
ELEV 440ft ETE ___ W122°18.58'
Press 'ENT' for hotspot info
16R
16C
16L
34L
34C
NAVIGATION MAP 1
MAP WX AUX FPL
DCLTR
MAP
ADVISORY

Figure 5-18 SafeTaxi Depiction on the Navigation Map Page

NOTE: *Do not use SafeTaxi or Chartview functions as the basis for ground maneuvering. SafeTaxi and Chartview functions do not comply with the requirements of AC 20-159 and are not qualified to be used as an airport moving map display (AMMD). SafeTaxi and Chartview are to be used by the flight crew to orient themselves on the airport surface to improve pilot situational awareness during ground operations.*

5.2.1 Using SafeTaxi®

Any map page that displays the navigation view can also show the SafeTaxi® airport layout within the maximum configured range. The following is a list of pages where the SafeTaxi feature can be seen:

- Navigation Map Page
- Weather Datalink Page
- Airport Information Page
- Intersection Information Page
- NDB Information Page
- VOR Information Page
- User Waypoint Information Page

During ground operations the aircraft's position is displayed in reference to taxiways, runways, and airport features. When panning over the airport, features such as runway holding lines and taxiways are shown.

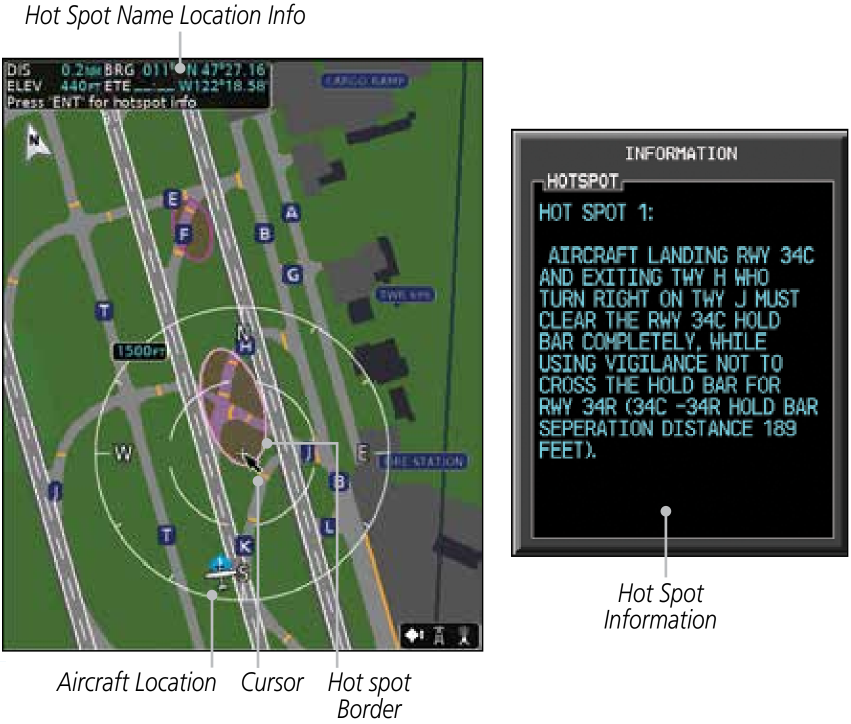
5.2.1.1 Decluttering

The **DCLTR** soft key (declutter) label advances to DCLTR-1, DCLTR -2, and DCLTR-3 each time the soft key is selected for easy recognition of decluttering level. Selecting the **DCLTR** soft key removes the taxiway markings and airport feature labels. Selecting the **DCLTR-1** soft key removes VOR station ID, the VOR symbol, and intersection names if within the airport plan view. Selecting the **DCLTR-2** soft key removes the airport runway layout, unless the airport in view is part of an active route structure. Pressing the **DCLTR-3** soft key cycles back to the original map detail. With Auto-Zoom enabled, the map will automatically zoom to 1 NM and DCLTR-0 upon landing so SafeTaxi can be viewed. Refer to Map Declutter Levels in the Navigation Map Section.

5.2.1.2 Hot Spot Information

Hot Spots can contain more information about the area that can be displayed when selected.

1. While viewing the Hot Spot area on the Navigation Map page, press the small **MFD** knob to activate the cursor.
2. Turn the **MFD** knobs to move the cursor on the Hot Spot border or into the Hot Spot area and then press the **ENT** key.



```
DIS    0.2NM BRG 011° N 47°27.16
ELEV   440FT ETE ___ W122°18.58
Press 'ENT' for hotspot info
```

```
INFORMATION
HOTSPOT
HOT SPOT 1:

 AIRCRAFT LANDING RWY 34C
AND EXITING TWY H WHO
TURN RIGHT ON TWY J MUST
CLEAR THE RWY 34C HOLD
BAR COMPLETELY, WHILE
USING VIGILANCE NOT TO
CROSS THE HOLD BAR FOR
RWY 34R (34C -34R HOLD BAR
SEPERATION DISTANCE 189
FEET).
```

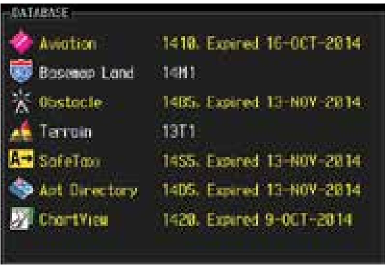
Hot Spot Name Location Info
CARGO RAMP
E
F
A
B
G
T
TWR
1500FT
H
W
J
E
FIRE STATION
B
L
T
K
J
Aircraft Location
Cursor
Hot spot Border
Hot Spot Information

Figure 5-19 SafeTaxi Hot Spot Information

3. An information window will be shown on the MFD. After viewing, press the small **MFD** knob, **CLR**, or **ENT** keys to remove the information window. Press the small **MFD** knob again to cancel the cursor.

5.2.2 SafeTaxi® Cycle Number and Revision

The SafeTaxi database is revised every 56 days. SafeTaxi is always available for use after the expiration date. When turning on the GDU 620, the Power-up Page indicates whether the databases are current, out of date, or not available. The Power-up Page shows the SafeTaxi database is current when the "SafeTaxi Expires" date is shown in white. When the SafeTaxi cycle has expired, the "SafeTaxi Expires" date appears in yellow. The message "SafeTaxi: N/A" appears in white if no SafeTaxi data is available on the database card.



```
DATABASE
Aviation        1410. Expired 16-OCT-2014
Basemap Land    14M1
Obstacle        1405. Expired 13-NOV-2014
Terrain         13T1
SafeTaxi        1455. Expired 13-NOV-2014
Apt Directory   1405. Expired 13-NOV-2014
ChartView       1420. Expired 9-OCT-2014
```

SafeTaxi Database Status

Figure 5-20 Power-up Page, SafeTaxi Database

The SafeTaxi Region, Version, Cycle, Effective date and Expires date of the database cycle can also be found on the AUX - System Status page. SafeTaxi information appears in white and yellow text. The EFFECTIVE date appears in white when data is current and in yellow when the current date is before the effective date. The EXPIRES date appears in white when data is current and in yellow when expired. SafeTaxi REGION NOT AVAILABLE appears in white if SafeTaxi data is not available on the database card. Expired SafeTaxi data is never disabled.

5.3 Sirius XM Satellite Radio Entertainment

***NOTE:** Refer to the Hazard Avoidance Section for information about XM WX Satellite Weather products.*

The optional Sirius XM Satellite Radio entertainment feature of the GDL 69A Data Link Receiver is available for the pilot's and passengers' enjoyment. The GDL 69A can receive Sirius XM Satellite Radio entertainment services at any altitude throughout the Continental U.S. Entertainment audio is not available on the GDL 69 Data Link Receiver.

Sirius XM Satellite Radio offers a variety of radio programming over long distances without having to constantly search for new stations. Based on signals from satellites, coverage far exceeds land-based transmissions. Sirius XM Satellite Radio services are subscription-based. For more information on specific service packages, visit http://www.garmin.com/xm/.

5.3.1 Activating Sirius XM Satellite Radio Services

The service is activated by providing Sirius XM Satellite Radio with either one or two coded IDs, depending on the equipment. Either the Audio Radio ID or the Data Radio ID, or both, must be provided to Sirius XM Satellite Radio to activate the entertainment subscription. The Sirius XM Satellite Radio Activation Instructions are included with the unit (also available at www.garmin.com, P/N 190-00355-04).

Sirius XM Satellite Radio and XM WX Satellite Weather subscriptions are sold separately. It is not required to activate both the entertainment and weather service subscriptions with the GDL 69A. Either or both services can be activated. Sirius XM Satellite Radio uses one or both of the coded IDs to send an activation signal that, when received by the GDL 69A, allows it to play entertainment programming.

These IDs are located:

- On the label on the back of the Data Link Receiver
- On the XM Information Page on the MFD

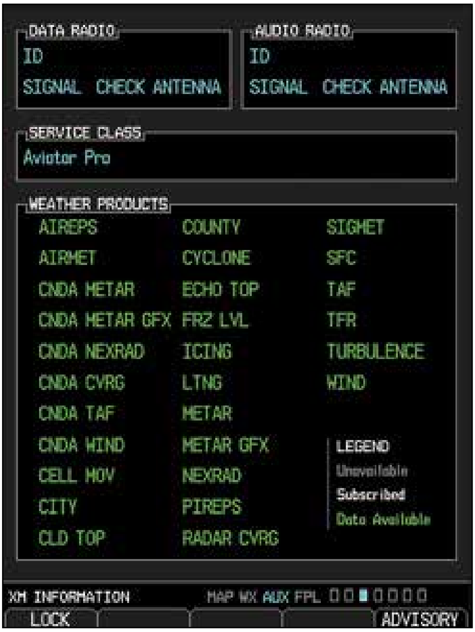
Contact the installer if the Data Radio ID and the Audio Radio ID cannot be located.

NOTE: *The* ***LOCK*** *soft key on the XM Information Page (Auxiliary Page Group) is used to save GDL 69A activation data when the Sirius XM Satellite Radio services are initially set up. It is not used during normal Sirius XM Satellite Radio operation, but there should be no adverse effects if inadvertently selected during flight. Refer to the GDL 69/69A Sirius XM Satellite Radio Activation Instructions (190-00355-04, Rev G, or later) for further information.*

If XM WX Satellite weather services have not been activated, the weather product names will be displayed in gray (see below) on the XM Information Page and a yellow Activation Required message is displayed in the center of the Weather Data Link Page (Map Page Group). The Service Class refers to the groupings of weather products available for subscription.

5.3.2 Sirius XM Satellite Radio Information

The Aux mode XM Information page displays information about the Sirius XM Satellite radios, service class, and products when the GDL 69/69A is installed and the Sirius XM Satellite Radio service is activated. The Data and Audio radios have separate Identification Numbers. The Service Class determines the features that are available. Products that are not part of the subscription are displayed in gray. Products that are part of the active subscription, but are waiting to receive data are white. Products that are part of the active subscription and have data are green.



DATA RADIO
ID
SIGNAL CHECK ANTENNA

AUDIO RADIO
ID
SIGNAL CHECK ANTENNA

SERVICE CLASS
Aviator Pro

WEATHER PRODUCTS
AIREPS
AIRMET
CNDA METAR
CNDA METAR GFX
CNDA NEXRAD
CNDA CVRG
CNDA TAF
CNDA WIND
CELL MOV
CITY
CLD TOP
COUNTY
CYCLONE
ECHO TOP
FRZ LVL
ICING
LTNG
METAR
METAR GFX
NEXRAD
PIREPS
RADAR CVRG
SIGMET
SFC
TAF
TFR
TURBULENCE
WIND

LEGEND
Unavailable
Subscribed
Data Available

Figure 5-21 Sirius XM Satellite Radio Information

1) In the AUX page group, turn the small **MFD** knob to display XM Information.

2) The **LOCK** soft key is used to “lock” your Sirius XM Satellite Radio subscription activation. This is only used for the initial subscription or to make a change.

NOTE: *Refer to the GDL 69/69A Sirius XM Satellite Radio Activation Instructions (190-00355-04, Rev G, or later) for further information.*

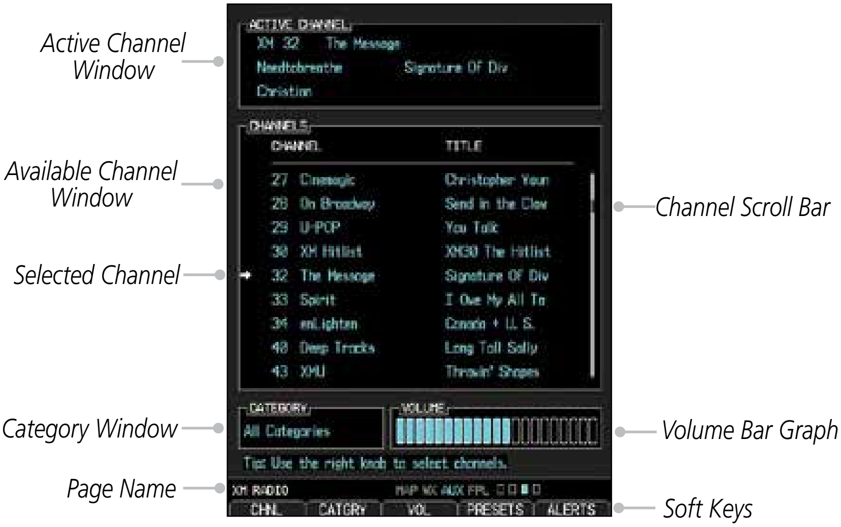
5.3.3 Sirius XM Satellite Radio Entertainment

Audio entertainment is available through the Sirius XM Satellite Radio Service when activated in the optional installation of the GDL 69A. The GDU 620 serves as the display and control head for your remotely mounted GDL 69A. Sirius XM Satellite Radio allows you to enjoy a variety of radio programming over long distances without having to constantly search for new stations. Based on signal from satellites, coverage far exceeds land-based transmissions. When enabled, the Sirius XM Satellite Radio audio entertainment is accessible in Aux page group.

The information on the Sirius XM Satellite Radio display is composed of four areas: the Active Channel, Available Channels, Category of the highlighted channel, and the Volume setting. The Active Channel window shows the Channel Name and Number, Artist, Song Title, and Category.

1) Turn the large **MFD** knob to Aux Mode.

2) Turn the small **MFD** knob to the XM Radio page.


Active Channel Window
Available Channel Window
Selected Channel
Category Window
Page Name
Channel Scroll Bar
Volume Bar Graph
Soft Keys
ACTIVE CHANNEL
CHANNELS
CATEGORY
VOLUME
XM RADIO
MAP WX AUX FPL
CHNL
CATGRY
VOL
PRESETS
ALERTS

XM 32 The Message
Needtobreathe Signature Of Div
Christian

CHANNEL	TITLE
27 Cinemagic	Christopher Youn
28 On Broadway	Send in the Clow
29 U-POP	You Talk
30 XM Hitlist	XM30 The Hitlist
→ 32 The Message	Signature Of Div
33 Spirit	I Owe My All To
34 enLighten	Canada + U. S.
40 Deep Tracks	Long Tall Sally
43 XMU	Throwin' Shapes

All Categories

Tip: Use the right knob to select channels.

Figure 5-22 Sirius XM Satellite Radio

5.3.3.1 Channel Categories

The Category window displays the currently selected category of audio. Categories of channels, such as Jazz, Rock, or News, can be selected to list the available channels for a type of music or other contents.

1) While viewing the XM Radio page of the AUX page group, press the **CATGRY** soft key to activate Category selection.

2) Turn the small **MFD** knob to select the desired category. When the MFD knob is turned to select a category, the soft keys will not be shown.

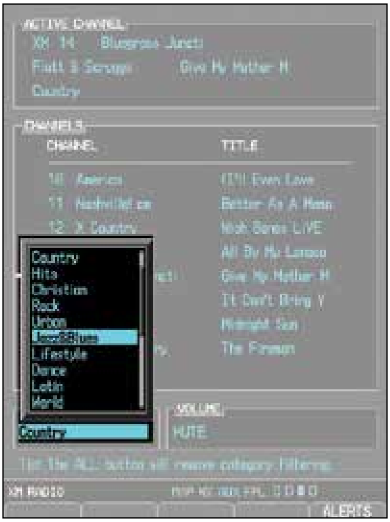

ACTIVE CHANNEL
CHANNELS
CHANNEL
TITLE
Country
Hits
Christian
Rock
Urban
Lifestyle
Dance
Latin
World
Country
VOLUME
MUTE
XM RADIO
ALERTS

Figure 5-23 XM Category List

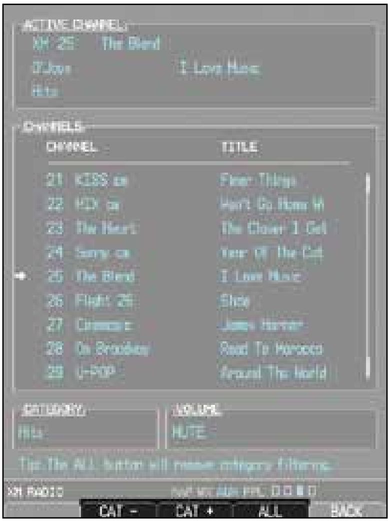

ACTIVE CHANNEL
CHANNELS
CHANNEL
TITLE
CATEGORY
Hits
VOLUME
MUTE
XM RADIO
CAT -
CAT +
ALL
BACK

Figure 5-24 XM Category Soft Keys

3) Press **ENT** to display the list of channels for the highlighted category in the Channels window.

4) Press the small **MFD** knob to cancel selection or to end editing.

OR

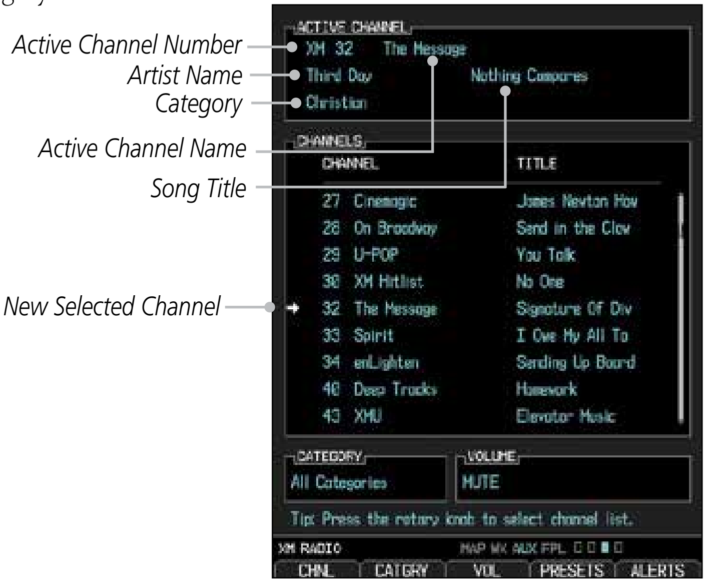
1) Press **CATGRY** and then the **CAT +** or **CAT –** soft keys to increment up or down one category at a time.

2) Press **ALL** to show the channels for all categories. Use the large and small **MFD** knobs to select desired channel.

3) Press **ENT** to save the selection or press the small **MFD** knob to cancel selection.

5.3.3.2 Selecting a Sirius XM Satellite Radio Channel

The Channel feature is used to navigate through the channels in the selected category.


Active Channel Number
Artist Name
Category
Active Channel Name
Song Title
New Selected Channel
ACTIVE CHANNEL
CHANNELS
CATEGORY
VOLUME
XM RADIO
MAP WX AUX FPL
CHNL
CATGRY
VOL
PRESETS
ALERTS

XM 32 The Message
Third Day Nothing Compares
Christian

CHANNEL	TITLE
27 Cinemagic	James Newton How
28 On Broadway	Send in the Clow
29 U-POP	You Talk
30 XM Hitlist	No One
→ 32 The Message	Signature Of Div
33 Spirit	I Owe My All To
34 enLighten	Sending Up Board
40 Deep Tracks	Homework
43 XMU	Elevator Music

CATEGORY: All Categories
VOLUME: MUTE

Tip: Press the rotary knob to select channel list.

Figure 5-25 XM Channel Selection

1) While viewing the XM Radio page of the AUX page group, press the small **MFD** knob and then turn the small **MFD** knob to select the desired channel.

2) Press **ENT** to make the highlighted channel the Active Channel.

NOTE: *A delay of several seconds may occur when selecting a channel. The listed title may end before the radio begins playing the current Active Channel material.*

3) Press the small **MFD** knob to cancel selection or to end editing.

OR

4) Press **CHNL** and then the **CH +** or **CH –** soft keys to increment up or down one channel at a time in the active category.

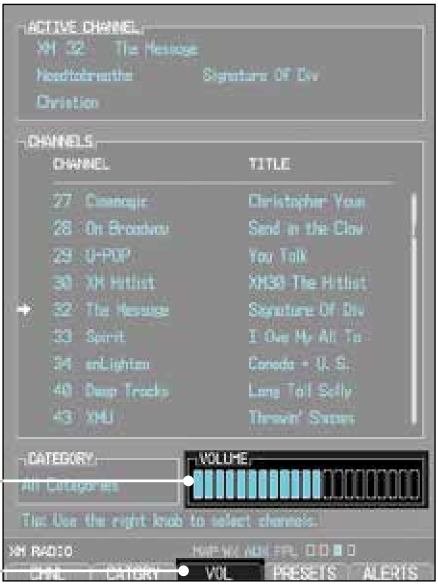
OR

5) Press **CHNL** and then the **DIR CH** soft key to directly select a channel in the active category. Use the large and small **MFD** knobs to select desired channel.

6) Press **ENT** to save the selection or press the small **MFD** knob to cancel selection.

5.3.3.3 Sirius XM Satellite Radio Volume

The Volume control allows you to set the audio volume level, as well as mute the audio.



ACTIVE CHANNEL

XM 32 The Message

Needtobreathe Signature Of Div

Christian

CHANNELS

CHANNEL	TITLE
27 Cinemagic	Christopher Youn
28 On Broadway	Send in the Clow
29 U-POP	You Talk
30 XM Hitlist	XM30 The Hitlist
32 The Message	Signature Of Div
33 Spirit	I Owe My All To
34 enLighten	Canada - U. S.
40 Deep Tracks	Long Tall Sally
43 XMU	Throwin' Stones

CATEGORY: All Categories

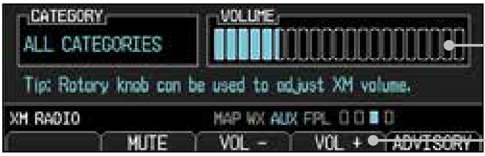
Tip: Use the right knob to select channels.

Volume Bar Graph

Volume Soft Key Label

Figure 5-26 XM Radio Volume Setting

1. While viewing the XM Radio page of the AUX page group, press the **VOL** soft key.
2. Press the **VOL +** or **VOL –** soft keys, or turn the small **MFD** knob, to adjust the radio volume.



CATEGORY: ALL CATEGORIES

Tip: Rotary knob can be used to adjust XM volume.

Volume Bar Graph

Volume Soft Key Labels

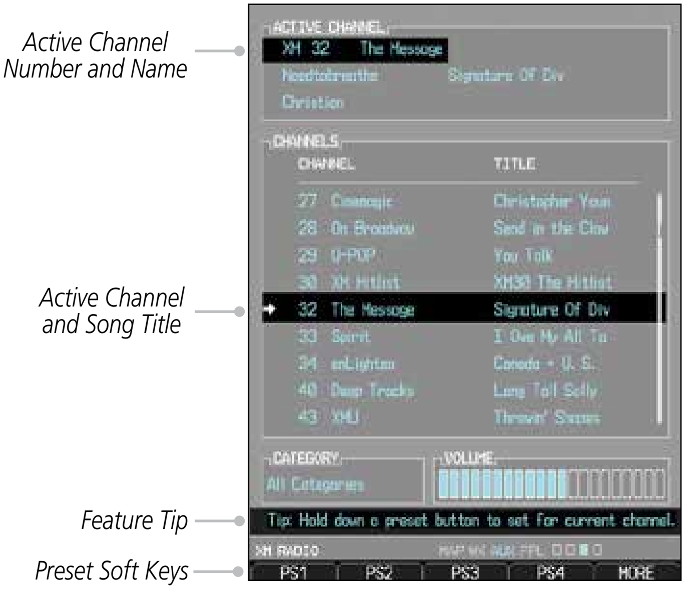
Figure 5-27 XM Radio Volume Controls

3) Press **MUTE** to mute the radio volume.

4) Press **MUTE** again or the **VOL +** or **VOL –** soft keys to unmute the radio volume.

5.3.3.4 Sirius XM Satellite Radio Channel Presets

The **PRESET** soft key allows you to store the Active Channel into a selected preset position for easy later recall. A delay of several seconds can occur when setting or recalling a preset.



Active Channel Number and Name
Active Channel and Song Title
Feature Tip
Preset Soft Keys
ACTIVE CHANNEL
CHANNELS
CATEGORY
VOLUME
XM RADIO
PS1
PS2
PS3
PS4
MORE

XM 32 The Message
Needtobreathe Signature Of Div
Christian

CHANNEL	TITLE
27 Cinemagic	Christopher Youn
28 On Broadway	Send in the Clow
29 U-POP	You Talk
30 XM Hitlist	XM30 The Hitlist
➔ 32 The Message	Signature Of Div
33 Spirit	I Owe My All To
34 enLighten	Canada - U. S.
40 Deep Tracks	Long Tall Sally
43 XMU	Throwin' Stones

All Categories

Tip: Hold down a preset button to set for current channel.

Figure 5-28 XM Radio Presets

Setting a Preset

1) While viewing the XM Radio page of the AUX page group, you may set a preset for the Active Channel. Press the **PRESETS** soft key.

2) Press and hold a preset soft key, such as **PS1**.

3) Press the **MORE** soft key to display the next series of presets.

Recalling a Preset

1) While viewing the XM Radio page of the AUX page group, press the **PRESETS** soft key.

2) Press the preset soft key for the desired stored channel, such as **PS1**.

3) Press the **MORE** soft key to display the next series of presets.

5.3.4 GDL 69/69A Data Link Receiver Troubleshooting

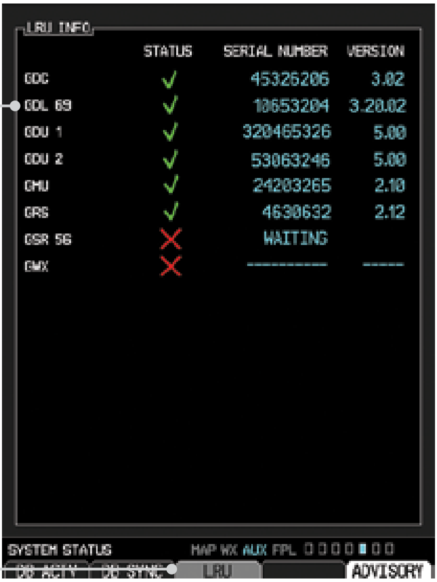
Some quick troubleshooting steps listed below can be performed to find the possible cause of a failure.

- Ensure the owner/operator of the aircraft in which the Data Link Receiver is installed has subscribed to Sirius XM Satellite Radio
- Ensure the Sirius XM Satellite Radio subscription has been activated
- Perform a quick check of the circuit breakers to ensure that power is applied to the Data Link Receiver

For troubleshooting purposes, check the LRU Information Box on the AUX - System Status Page for Data Link Receiver (GDL 69/69A) status, serial number, and software version number. If a failure has been detected in the GDL 69/69A the status will be marked with a red "X."

1) Turn the large **MFD** knob to select the AUX Page Group.

2) Turn the small **MFD** knob to select the System Status Page (the last page in the AUX Page Group).



LRU INFO

	STATUS	SERIAL NUMBER	VERSION
GDC	✓	45326206	3.02
GDL 69	✓	10653204	3.20.02
GDU 1	✓	320465326	5.00
GDU 2	✓	53063246	5.00
GMU	✓	24203265	2.10
GRS	✓	4630632	2.12
GSR 56	✗	WAITING	
GWX	✗	----------	-----

GDL 69 Status OK

LRU Selection

Figure 5-29 LRU Status Window

5.4 Autopilot Operation

The G500/600 is able to interface to certain autopilot systems to provide the functions described in this section. Please refer to your particular Airplane Flight Manual and autopilot documentation for specific information and operating instructions.

5.4.1 GAD 43 Attitude

The GAD 43 Adapter may Optionally provide attitude information from the Garmin GRS 77 Attitude and Heading Reference System to certain autopilots. The GAD 43 has the ability to disconnect the autopilot if an error in the GAD 43 output or GRS 77 is detected. This disconnect mechanism must be tested prior to each flight in the following manner:

1) Allow all avionics to complete power up and begin normal operation.

2) Engage the autopilot while on the ground.

3) Press the **AP TEST** soft key and verify that the autopilot disconnects normally.

CAUTION: *Do not use the autopilot if the AP TEST does not disengage the autopilot normally.*

Autopilot Disconnect

When the GDU 620 attitude monitors have detected an AHRS malfunction, or the inability to actively monitor the AHRS, a "Check Attitude" annunciation will be displayed on the PFD and the autopilot will automatically disconnect.

NOTE: *Only appears with the installation of an optional GAD 43 Adapter.*

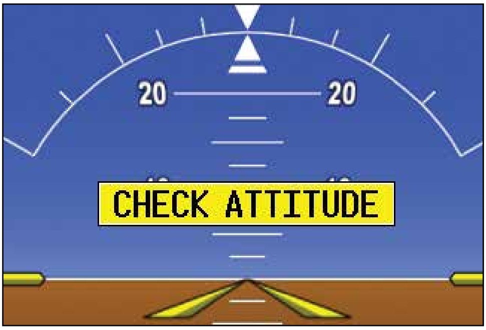


Figure 5-30 - Check Attitude - Autopilot Automatically Disconnected

Fly the aircraft manually and crosscheck the GDU 620 attitude indication with the standby attitude indicator and other sources of attitude information (airspeed, heading, altitude, etc.).

5.4.2 Heading

The GDU 620 heading bug may be used in conjunction with the "Heading" mode of supported autopilots. When the autopilot is in "heading" mode and the heading bug is adjusted in the normal manner, and the autopilot will turn to and maintain the selected heading. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the autopilot heading mode.

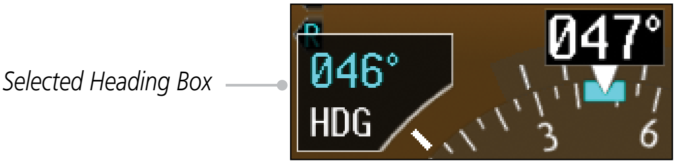


Figure 5-31 Adjusting the Heading Bug

5.4.3 Altitude Capture (Optional Upgrade)

The GDU 620 altitude bug may be used to automatically capture a selected altitude with certain autopilots. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the altitude preselect feature, if available.

Adjust the altitude bug in the normal manner when using the altitude capture interface. Some autopilot installations support arming and disarming of the selected altitude using the ALT key on the PFD. The PFD knob window will indicate when this function is available. The selected altitude may be alternately armed or disarmed by pressing and holding the ALT key on the PFD bezel.

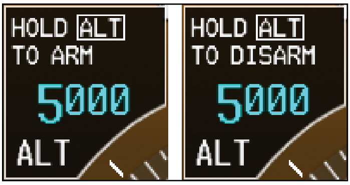


Figure 5-32 Pressing and Holding the ALT Key to Arm/Disarm the Selected Altitude

5.4.4 Autopilot Navigation

The HSI may be used in conjunction with the appropriate navigation modes of supported autopilots. The GDU 620 provides the autopilot with the selected course and lateral/vertical deviations. The GDU 620 acts as a switching source between the installed navigation sources (e.g GPS/VLOC, 1-2). The navigation source that is displayed on the HSI is sent to the autopilot. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the autopilot navigation functions.

GPS Steering (GPSS) provides roll command signals calculated by the GPS navigator to the autopilot in order to allow the aircraft to anticipate turns, make smooth transitions when passing waypoints, and fly leg types such as Procedure Turns and Holding Patterns. The autopilot must have the ability to interpret the GPSS commands. The G500/600 can provide GPSS information to autopilots that have built-in support for GPSS commands, as well as to older autopilots that do not have built-in support for GPSS.

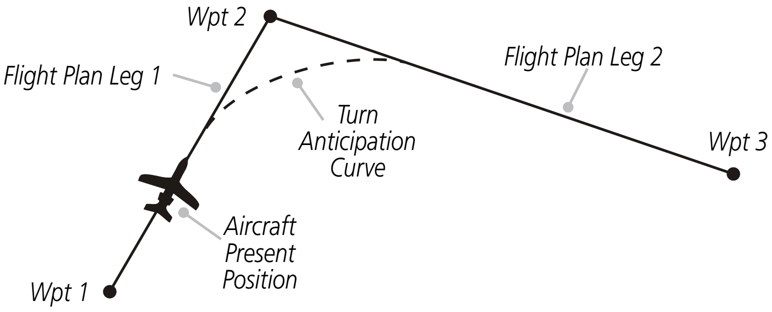


Figure 5-33 GPSS Turn Anticipation

5.4.4.1 Autopilot Operation with GPSS Enabled Autopilots

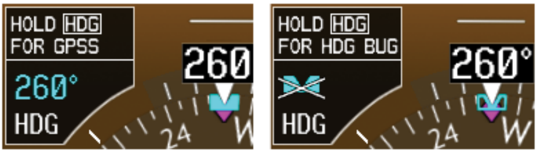
Some autopilots have built-in support for GPS Steering (GPSS) commands from a GPS navigator. The GDU 620 will send the GPSS commands from the displayed GPS source to the autopilot. For example, if GPS 1 is displayed on the HSI, the GPSS commands from GPS 1 will be sent to the autopilot. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the autopilot's GPSS function.

***NOTE:** GPSS commands are not sent to the autopilot when a VLOC source is displayed on the HSI.*

5.4.4.2 Autopilot Operation with the GDU 620 Emulating GPSS

In order to provide GPSS functionality for autopilots that do not have built-in GPSS support, the GDU 620 can convert the GPSS commands into a heading signal. When GPSS mode is turned on, the autopilot heading mode will follow the GPSS commands instead of the heading bug. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the autopilot heading mode.

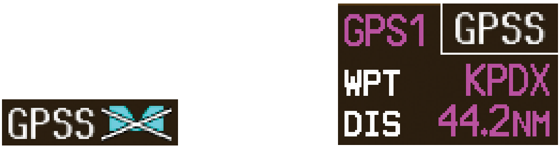
Depending on the installation, GPSS mode may be toggled on/off with an external switch or by pressing and holding the **HDG** key on the PFD. If the installation uses the **HDG** key on the PFD, the **PFD** knob window will display the GPSS/HDG mode options.



GPSS OFF GPSS ON

Figure 5-34 GPSS mode control with the HDG key

When GPSS mode is on, the heading bug on the HSI changes to a hollow outline and a crossed-out heading bug appears in the PFD Knob Mode Indicator, indicating that the autopilot is not coupled to the heading bug. The bug is still controllable and may still be used by the pilot for reference. GPSS is annunciated in the lower left portion of the PFD. The GPSS mode annunciation depends on the location of the NAV STATUS information, as shown in the following figure.



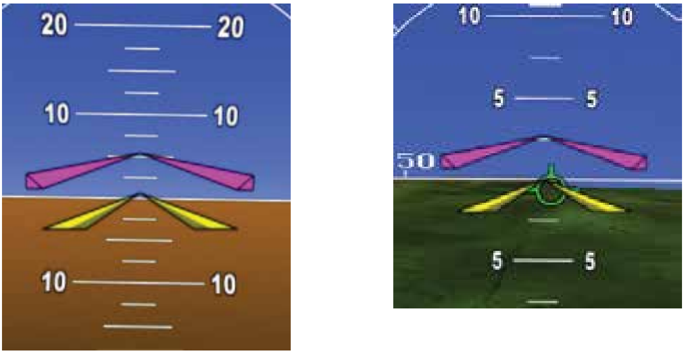
NAV Status Style 1 NAV Status Style 2

Figure 5-35 GPSS Mode Annunciations

5.4.5 Flight Director Display

If autopilot flight director commands are interfaced to the G500/600, they will be presented as a single cue flight director on the PFD. Control of the flight director is accomplished via the autopilot/flight director controller; there are no pilot controls or adjustments for the flight director on the G500/600.

The G500/600 system limits the distance the flight director pitch commands may deviate from the aircraft attitude icon. In the event that the pitch command provided by the autopilot flight director is greater than the distance allowed by the G500/600, the command bars will be displayed at the maximum distance allowed by the G500/600. As the aircraft pitch changes to satisfy the command bars, the bars will continue to be displayed at the maximum distance from the aircraft attitude icon until the aircraft pitch deviation is within the command display limit.



SVT Off **SVT On**

Figure 5-36 Flight Director Bars Showing Aircraft Pitch

5.4.6 Vertical Speed Control

The GDU 620 vertical speed bug may be used to control vertical speed with certain autopilots. Refer to the Airplane Flight Manual and autopilot system documentation for instructions on how to use the vertical speed mode, if available.

Adjust the vertical speed bug in the normal manner when using the vertical speed mode interface. Some autopilot installations support engaging/disengaging the vertical speed mode using the VS key on the PFD. The PFD knob window will indicate when this function is available. The vertical speed mode may be alternately engaged or disengaged by pressing and holding the VS key on the PFD bezel.

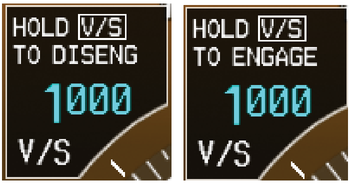


Figure 5-37 Pressing and Holding the VS Key to Engage/Disengage VS mode

5.4.7 Autopilot Mode Annunciations

Some autopilots support mode annunciations located at the top of the PFD. Refer to the Airplane Flight Manual and autopilot system documentation for details on the autopilot mode annunciations.

When autopilot annunciations are displayed at the top of the PFD, the Nav Status information will be located to the left of the HSI (NAV STATUS Style 2).

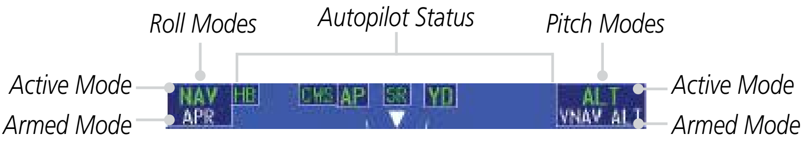

Roll Modes
Autopilot Status
Pitch Modes
Active Mode
Armed Mode
NAV
APR
HB
CWS
AP
SR
YD
ALT
VNAV ALT
Active Mode
Armed Mode

Figure 5-38 Autopilot Annunciations on Top of PFD

5.5 Synthetic Vision Technology (Optional) (SVT™)

The optional Synthetic Vision Technology (SVT™) is a visual enhancement to the G500/600. SVT is displayed as a forward-looking display of the topography immediately in front of the aircraft. SVT information is shown on the primary flight display (PFD). The depicted imagery is derived from the aircraft attitude, heading, GPS three-dimensional position, and a database of terrain, obstacles, and other relevant features.

The following SVT enhancements appear on the PFD:

- Flight Path Marker
- Horizon Heading Marks
- Traffic Display
- Airport Signs
- Runway Display
- Terrain Alerting
- Obstacle Alerting
- Water
- Zero-Pitch Line

Foreword
Sec 1 System
Sec 2 PFD
Sec 3 MFD
Sec 4 Hazard Avoidance
Sec 5 Additional Features
Sec 6 Annun. & Alerts
Sec 7 Symbols
Sec 8 Glossary
Appendix A
Appendix B Index

SVT offers a three-dimensional view of terrain and obstacles. Terrain and/or obstacles that pose a threat to the aircraft in flight are shaded yellow or red.

NOTE: *SVT will become disabled if the databases necessary to display SVT are unavailable (generating a GDU DB ERR or SVT DISABLED alert) or AHRS or GPS data is unavailable.*

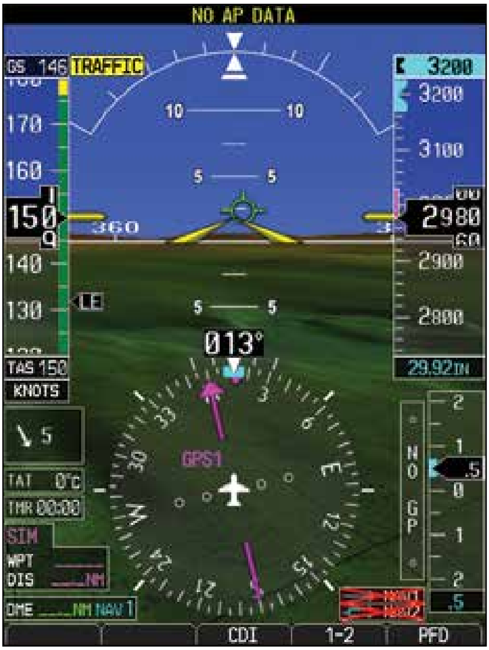

NO AP DATA
GS 146
TRAFFIC
3200
170
160
150
140
130
10
5
360
3100
2980
2900
2800
013°
TAS 150
KNOTS
29.92IN
5
TAT 0°C
TMR 00:00
SIM
WPT
DIS NM
DME NM NAV1
GPS1
N
E
S
W
NO GP
CDI
1-2
PFD

Figure 5-39 Synthetic Vision Imagery - PFD

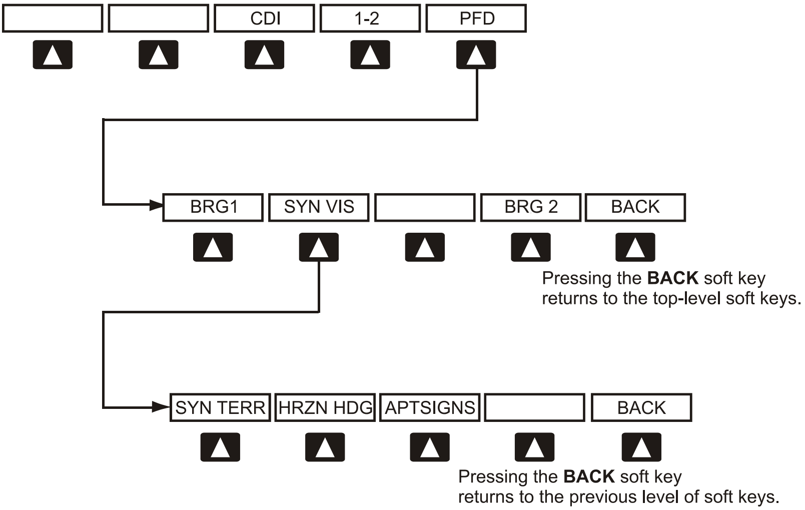
5.5.1 SVT™ Operation

SVT™ is activated from the PFD using the soft keys located along the bottom edge of the display. Pressing the soft keys turn the related function on or off.

SVT functions are displayed on three levels of soft keys. The **PFD** soft key leads into the PFD function soft keys, including synthetic vision. Pressing the **SYN VIS** soft key enables synthetic vision and displays the **SYN TERR**, **HRZN HDG**, and **APTSIGNS** soft keys. The **BACK** soft key returns to the previous level of soft keys.

HRZN and **APTSIGNS** soft keys are dependent upon the state of the **SYN TERR** soft key. When Synthetic Terrain is deactivated, the **SYN TERR** soft key appears illuminated while the remaining SVT soft keys are unavailable for selection and subdued (black with dark-gray characters). If Synthetic Terrain is deactivated, all other SVT features are also deactivated. With Synthetic Terrain activated, all other SVT features may be turned on or off at the pilot's discretion.

- SYN TERR soft key enables synthetic terrain depiction.
- HRZN HDG soft key enable horizon heading marks and digits.
- APTSIGNS soft key enables airport signposts.



Pressing the **BACK** soft key returns to the top-level soft keys.

Pressing the **BACK** soft key returns to the previous level of soft keys.

Figure 5-40 SVT Soft Keys

5.5.2 Activating and Deactivating SVT™

NOTE: *In some instances, such as temporary loss of GPS signal, the SVT functionality will be disabled.*

To enable SVT:

1) Press the **PFD** soft key.
2) Press the **SYN VIS** soft key.
3) Press the **SYN TERR** soft key to view the SVT™ display.

When SVT™ is enabled, the pitch ladder will display a different pitch scale.

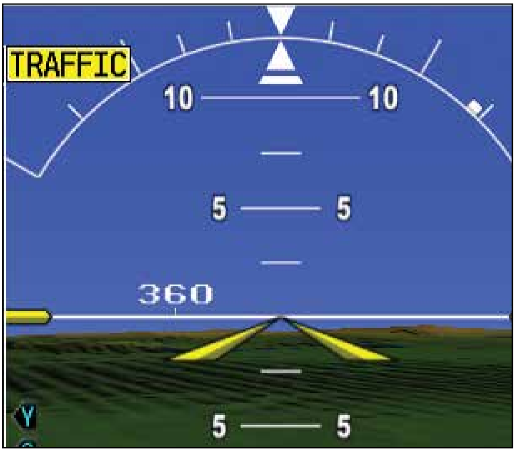


Figure 5-41 Pitch Scale with SVT Enabled

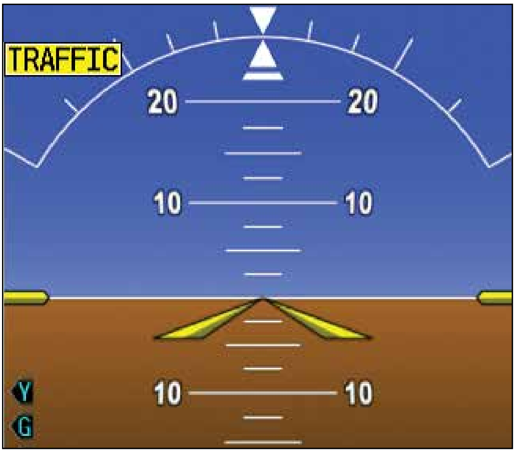


Figure 5-42 Pitch Scale with SVT Disabled

5.5.3 SVT™ Features

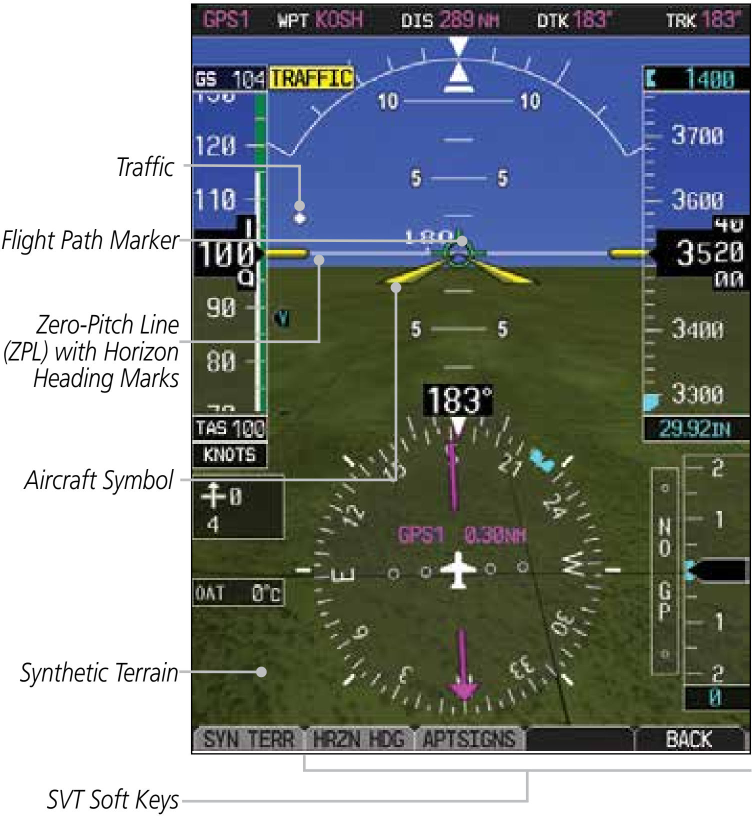

GPS1 WPT KOSH DIS 289NM DTK 183° TRK 183°
GS 104
TRAFFIC
1400
3700
3600
3520
3400
3300
29.92IN
120
110
100
90
80
TAS 100 KNOTS
OAT 0°C
183°
GPS1 0.30NM
NO GP
SYN TERR
HRZN HDG
APTSIGNS
BACK
Traffic
Flight Path Marker
Zero-Pitch Line (ZPL) with Horizon Heading Marks
Aircraft Symbol
Synthetic Terrain
SVT Soft Keys

Figure 5-43 SVT on Primary Flight Display

***NOTE:** SVT features are not a substitute for standard course and altitude deviation information using the CDI, VSI, and VDI presentations.*

5.5.3.1 Flight Path Marker (FPM)

The Flight Path Marker is also known as a Velocity Vector. It is displayed on the PFD at ground speeds above 30 knots. The FPM depicts approximate projected path of the aircraft.

5.5.3.2 Zero-Pitch Line

The Zero-Pitch Line is drawn completely across the display and provides a reference line by which to judge aircraft attitude with respect to the horizon. It is not necessarily aligned with the terrain horizon, particularly when the terrain is sloped or mountainous.

5.5.3.3 Horizon Heading

The Horizon Heading is synchronized with the HSI and shows compass headings in 30-degree increments on the Zero-Pitch Line. Horizon heading tick marks and digits appearing on the zero-pitch line are not visible when they are behind either the airspeed or altitude display. Horizon Heading is activated and deactivated by pressing the **HRZN HDG** soft key.

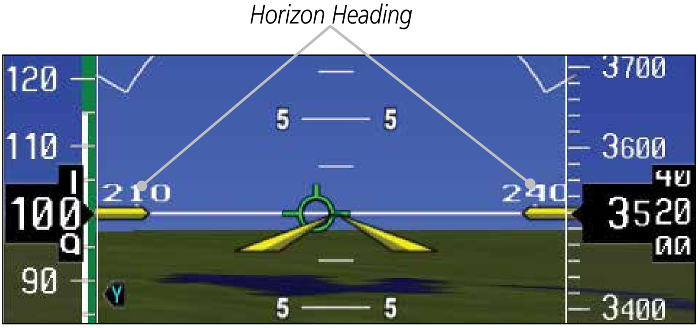

Horizon Heading
120
110
100
90
210
240
5
5
3700
3600
40
3520
00
3400

Figure 5-44 Horizon Heading

5.5.3.4 Airport Signs

Airports Signs provide a visual representation of airport location and identification on the synthetic terrain display. When activated, the signs appear on the display when the aircraft is approximately 15 NM from an airport and disappear at approximately 4.5 NM. Airport signs are shown without the identifier until the aircraft is approximately 9 NM from the airport. Airport signs are shown behind the airspeed or altitude display. Airport signs are activated and deactivated by pressing the **APT SIGNS** soft key.

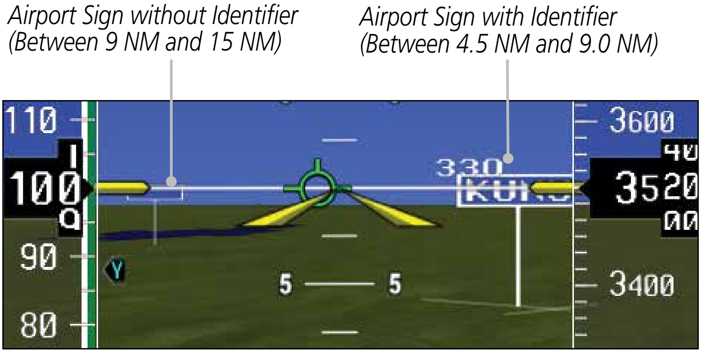

Airport Sign without Identifier (Between 9 NM and 15 NM)
Airport Sign with Identifier (Between 4.5 NM and 9.0 NM)
110
100
90
80
330
5
5
3600
40
3520
00
3400

Figure 5-45 Airport Signs

5.5.3.5 Runway Depiction

Runways are shown on the PFD in various ways. Soft surface runways, such as grass runways, are depicted in green. Hard surface runways, such as asphalt, are depicted in gray. Your flight plan will determine how the runway is displayed on the PFD.

Without a loaded flight plan, a runway is shown as dark gray with the boundaries of the runway in light gray.

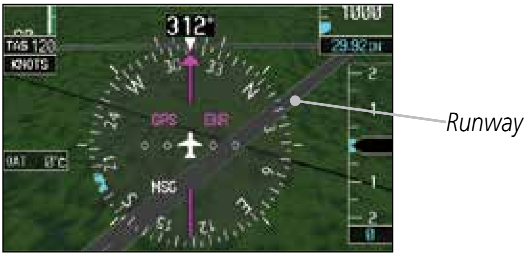


Figure 5-46 Depiction of Runway with a Loaded Flight plan

A runway that is not in a loaded flight plan is shown as dark gray with no other colors.

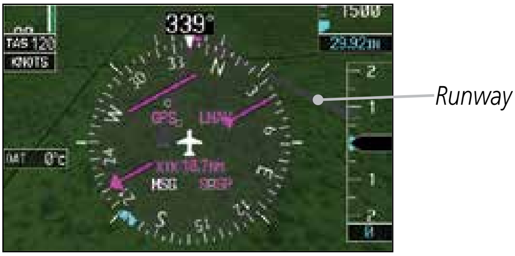


Figure 5-47 Depiction of Runway Not in Loaded Flight plan

A runway that is associated with an approach in the loaded flight plan is outlined with a white rectangle, with the actual runway, in that rectangle.

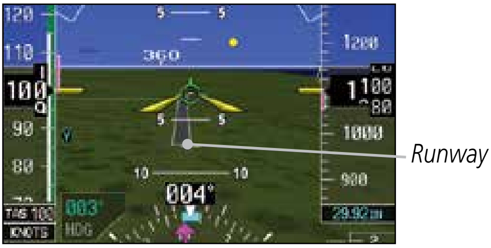


Figure 5-48 Depiction of Runway with Loaded Approach

5.5.3.6 Traffic

Traffic symbols are displayed in their approximate respective location as determined by the related traffic systems. TIS, TAS and ADS-B traffic are all displayed. Traffic is displayed in three dimensions, appearing larger as they are getting closer, and smaller when they are further away.

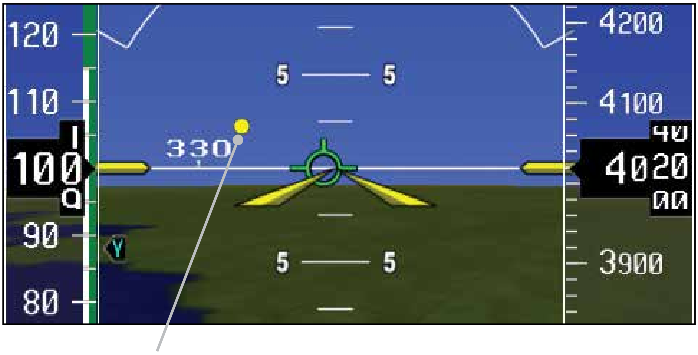

120
110
100
90
80
5
5
330
4200
4100
4020
3900
Traffic on PFD

Figure 5-49 Traffic Depiction on the PFD

5.5.3.7 Obstacles

Obstacles are represented on the synthetic display by two-dimensional tower or windmill symbols found on the MFD maps and charts. Obstacle symbols appear in the perspective view with relative height above terrain and distance from the aircraft.

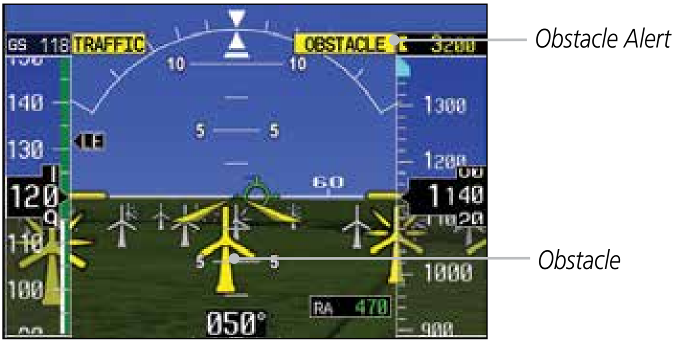

GS 118
TRAFFIC
OBSTACLE
3200
10
10
140
130
120
110
100
5
5
60
1300
1200
1140
1000
RA 470
050°
Obstacle Alert
Obstacle

Figure 5-50 Obstacle Depiction on PFD

Unlike the MFD moving map display, obstacles on the synthetic terrain display do not change colors based on relative altitude but will be colored to match any SVT TERRAIN or TAWS Alert from that obstacle. Obstacles greater than 1000 feet below the aircraft's altitude are not shown. Obstacles are shown behind the airspeed and altitude displays.

5.5.3.8 Unusual Attitudes

Unusual attitudes are displayed with red chevrons overlaid on the display, pointing to the direction to fly to correct the unusual attitude condition. The display shows either a brown or blue band of color at the top or bottom of the screen to represent earth or sky. This is intended to prevent losing sight of the horizon during extreme pitch attitudes.

Two conditions that inhibit SVT and generate alerts on the PFD:

- The position of the aircraft exceeds the range of the terrain database.
- The terrain database is out of date using an older terrain database card.

Blue Band - Sky Representation

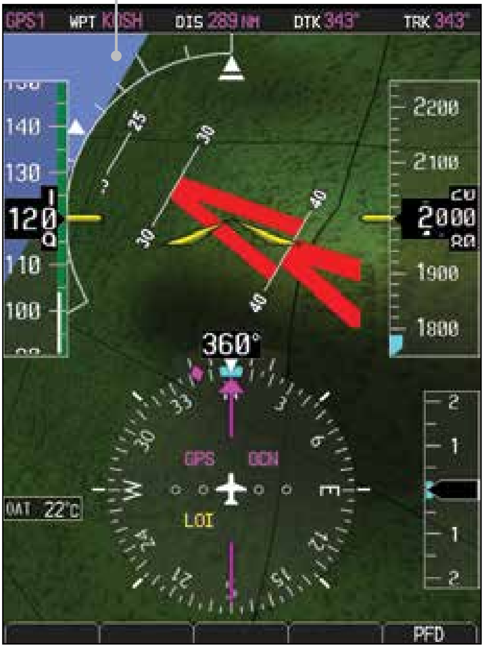
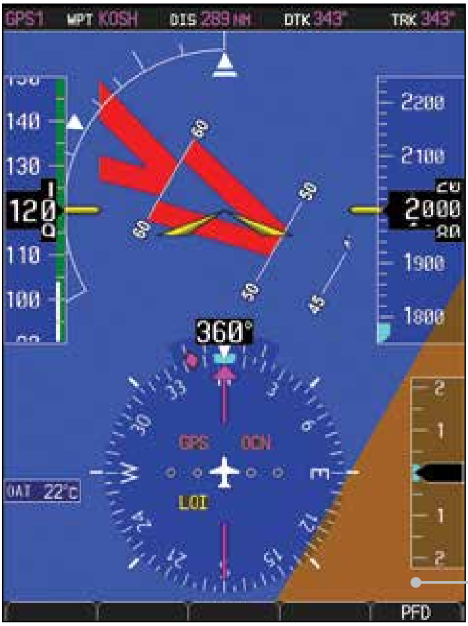
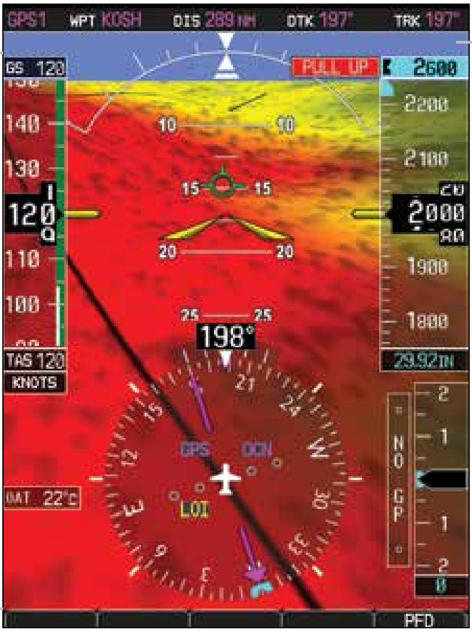

GPS1
WPT KOSH
DIS 289 NM
DTK 343°
TRK 343°
140
130
120
110
100
2200
2100
2000
1900
1800
360°
GPS
OCN
LOI
OAT 22°C
PFD

Figure 5-51 Unusual Attitude Display - Blue Band


GPS1
WPT KOSH
DIS 289 NM
DTK 343°
TRK 343°
140
130
120
110
100
2200
2100
2000
1900
1800
60
50
45
360°
GPS
DCN
LOI
OAT 22°C
PFD

Brown Band - Ground Representation

Figure 5-52 Unusual Attitude Display - Brown Band


GPS1
WPT KOSH
DIS 289 NM
DTK 197°
TRK 197°
GS 120
PULL UP
2600
140
130
120
110
100
10
15
20
25
2200
2100
2000
1900
1800
198°
TAS 120 KNOTS
29.92IN
NO GP
GPS
DCN
LOI
OAT 22°C
PFD

Blue Band - Sky Representation

Terrain Fills Display

Figure 5-53 Blue Sky Bar with Full Display Terrain

6 ANNUNCIATIONS AND ALERTS

6.1 Alerts

Alerts are displayed on the MFD and are accessible via the **ALERTS MFD** soft key. When a new advisory is present, the **ALERTS** soft key text changes to **ADVISORY** and flashes until the alerts page is viewed.

The MFD ALERTS page may have two additional soft keys (**TRND/ACK** and **CAPTURE**) which are present when interfaced to an optional ADAS+ Engine Trend Monitor (ETM). Pressing the **TRND/ACK** soft key is equivalent to pressing the **ETM Trend** key for one second. Pressing the **CAPTURE** soft key is equivalent to pressing the **ETM Trend** key for five seconds. Refer to the Airplane Flight Manual and ADAS+ ETM documentation for the system description and operating procedures.

Alert Message	Description	Action
ADC1/2 ALT EC	• ADC Altitude Error Correction is unavailable. • The alert is enabled and the GDC is reporting that altitude correction is unavailable.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
AHRS1 GPS	• AHRS1/2 not receiving any GPS information. • AHRS1/2 operating exclusively in no-GPS reversionary mode. • AHRS1/2 using backup GPS source. • AHRS1/2 not receiving backup GPS information. • Two GPS devices are configured as present and AHRS1 is not receiving GPS data from the backup (2nd) device.	• Verify navigators are on and have a GPS signal and are not in self-test mode. • Check AFMS for limitations. • Contact your Garmin dealer for service.
AHRS1/2 SRVC	• AHRS1/2 magnetic-field model needs update. • Appears on ground only.	• AHRS magnetic field model should be upgraded. • Contact your Garmin dealer for service.
AHRS1/2 TAS	• AHRS1/2 not receiving true airspeed from ADC. • Displayed heading and attitude data is still valid. • Additional loss of GPS data will cause loss of heading and attitude data.	• Check ADC cable. • Contact your Garmin dealer for service.

Alert Message	Description	Action
ALT KEY INOP	- The ALT key is disabled.	- ALT key is not available.
ALT NO COMP	- No data from one or more altitude sensors.	- Contact your Garmin dealer for service.
ARINC 429 CONFIG	- ARINC 429 configuration error.	- Contact your Garmin dealer for service.
ARINC 708 CONFIG	- ARINC 708 configuration error.	- Contact your Garmin dealer for service.
AUD NOT AVAIL	- Audio system not available.	- Contact your Garmin dealer for service.
AUD SYS FAIL	- Audio system failure.	- Contact your Garmin dealer for service.
CAL LOST	- Calibration Data Lost.	- Contact your Garmin dealer for service.
CNFG MISMATCH	- GDU 1-2 airframe configuration settings disagree.	- Contact your Garmin dealer for service.
CNFG MODULE	- GDU configuration module is inoperative.	- Contact your Garmin dealer for service.

Alert Message	Description	Action
DATALINK	• GDL 88 ADS-B Failure. Unable to transmit ADS-B messages. • GDL 88 ADS-B fault. • ADS-B fault: UAT receiver. • ADS-B fault: 1090 receiver. • GDL 88 needs service. • GDL 88 ADS-B is not transmitting position. Check GPS devices. • GDL 88 control panel input fault. Check transponder mode. • GDL 88 ADS-B fault. Pressure altitude source inoperative. • GDL 88 external traffic system inoperative or connection lost. • GDL 88 configuration module needs service. • GDL 88 is inoperative or connection to GDU is lost. • GDL 88 CSA failure.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
DATALINK (cont)	• GDL 88 external traffic system has a low battery. • GDL 88 external traffic system in standby for more than 60 seconds.	
DATA LOST	• Pilot stored data was lost. Recheck data and settings.	• Reset your settings. • G500/600 pilot configurable items have been returned to default settings.
DB ERR	• Database found on top card.	• Remove database or move to bottom slot.
DB SYNC COMPLETE	• Database sync complete.	• Restart required to use new databases.
DB SYNC DISABLED	• No database card found to receive databases.	• Contact your Garmin dealer for service.
DB SYNC ERROR	• Not enough space to receive one or more databases.	• Contact your Garmin dealer for service.
DIAG MODE	• System is in Diagnostic Mode.	
DSCRT CONFIG	• Discrete outpout configuration error.	• Contact your Garmin dealer for service.
ENG SENSOR UNIT 1/2	• Configuration error. Communication with sensors is halted. • Communication with sensors lost.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
ETM CAPTURE	• Engine Trend Monitor data capture. • ADAS+ engine trend monitor is recording trend data.	• Refer to ADAS+ documentation for appropriate action.
ETM EXCEED	• Engine Trend Monitor exceedence/advisory. • ADAS+ engine trend monitor is reporting an exceedence or advisory condition.	• Refer to ADAS+ documentation for appropriate action.
ETM FAULT	• Engine Trend Monitor needs service. • ADAS+ engine trend monitor is reporting a system fault.	• Refer to ADAS+ documentation for appropriate action.
FAN 1/2 FAIL	• Cooling fan 1/2 has failed. • Unit may operate at extreme temperatures • Extended operation at high temperatures is not recommended as damage to the GDU may occur. • PFD/MFD coloration may be incorrect. • Backlight may dim to reduce power and heat.	• Contact your Garmin dealer for service.
GAD 43	• GAD 43 communication lost.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
GAD 43	- Gyro Emulation Type Mismatch Fault.	- Contact your Garmin dealer for service.
GAD 43	- Yaw Rate Scale Factor Mismatch Fault.	- Contact your Garmin dealer for service.
GAD 43	- GDU AHRS Monitor Fault.	- Contact your Garmin dealer for service.
GAD 43	- Pitch Deviation Fault.	- Contact your Garmin dealer for service.
GAD 43	- Roll Deviation Fault.	- Contact your Garmin dealer for service.
GAD 43	- Yaw Rate Deviation Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS A429 Attitude Time out Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS A429 Attitude Invalid Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS Pitch Out of Range Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS Attitude Invalid Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS A429 Heading Time-out Fault.	- Contact your Garmin dealer for service.
GAD 43	- AHRS A429 Heading Invalid Fault.	- Contact your Garmin dealer for service.
GAD 43	- Power Supply Fault.	- Contact your Garmin dealer for service.
GAD 43	- AC Reference Lost.	- Contact your Garmin dealer for service.
GAD 43	- Application SCI integrity fault.	- Contact your Garmin dealer for service.
GAD 43	- Configuration integrity fault.	- Contact your Garmin dealer for service.

Alert Message	Description	Action
GAD 43	• Calibration integrity fault.	• Contact your Garmin dealer for service.
GAD 43	• Unit fault.	• Contact your Garmin dealer for service.
GAD 43E CONFIG	• GAD 43e configuration error. Communication halted.	• Contact your Garmin dealer for service.
GATE MODE	• Automated testing is on.	
GDC CONFIG	• GDC config error.	• Contact your Garmin dealer for service.
GDL69	• GDL 69 has failed.	• Contact your Garmin dealer for service.
GEO LIMITS	• AHRS1 too far North/ South, no magnetic heading provided. • Operating in extreme north latitudes has rendered heading data unreliable.	• Use alternate means of navigation. • Check AFMS for limitations.
GPS1/2 FAIL	• Communication lost with GPS 1/2.	• Use an alternate navigation source.
GPS(1/2) PPS FAIL	• Timing data from GPS 1/2 is lost.	• Contact your Garmin dealer for service.
GSR FAIL	• GSR has failed.	• Contact your Garmin dealer for service.
GWX CONFIG	• GWX config error. Config service required.	• Contact your Garmin dealer for service.
GWX SERVICE	• GWX needs service.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
HDG FAULT	• AHRS1/2 in no-magnetometer reversionary mode. • Heading fault state on AHRS. • Heading data is unreliable.	• Check AFMS for limitations. • Use Compass or other course information. • Contact your Garmin dealer for service.
HDG LOST	• HDG features disabled or defaulted to GPS1 TRK. • GDU is in the reversionary track-based mode.	
HTAWS	• External HTAWS not available. Internal TERRAIN-HSVT alerting enabled. • External HTAWS configuration mismatch.	• Contact your Garmin dealer for service.
IAS NO COMP	• No data from one or more airspeed sensors.	• Contact your Garmin dealer for service.
<LRU> CONFIG	• Error in the configuration of a specific LRU, where <LRU> denotes a specific LRU, such as GDL69 or GWX.	• Config service required. Contact your Garmin dealer for service.

Alert Message	Description	Action
<LRU> COOLING	• <LRU> has poor cooling. Reducing power usage by dimming display.	• Specific LRU has poor cooling, where <LRU> denotes the specific LRU and power is being reduced. • Contact your Garmin dealer for service.
<LRU> DB ERR	• <LRU> database error exists, where "<LRU> database" denotes the specific unit database.	• Replace or update database.
<LRU> KEYSTK	• <LRU> <KEY> is stuck. The <LRU> has detected the <KEY> key as stuck, where <LRU> and <KEY> denote a specific LRU and key.	
<LRU> SERVICE	• <LRU> needs service. Contact repair facility.	• Contact your Garmin dealer for service. Specific LRU should be serviced, where <LRU> denotes the specific LRU.
<LRU> VOLTAGE	• <LRU> has low voltage. Reducing power usage by dimming display, where <LRU> denotes the specific LRU and power is being reduced.	• Contact your Garmin dealer for service.
MANIFEST	• <LRU> software mismatch, communication halted.	• Contact your Garmin dealer for service.

Alert Message	Description	Action
NAV1/2	• Communication with NAV1/2 is lost. • No navigation receiver 1/2 data.	• Switch to alternate navigation (GPS or otherwise) if available.
NO RADAR DATA	• No data is being sent to the GDU	• Contact your Garmin dealer for service.
PIT NO COMP	• No data from one or more pitch attitude sensors.	• Contact your Garmin dealer for service.
PREV EXCEED	• Previous Engine Trend Monitor exceedence. • ADAS+ engine trend monitor is reporting a previous exceedence.	• Refer to ADAS+ documentation for appropriate action.
RADAR CONTROLS DISAGREE	• Data does not match for 15 seconds, or more	• Contact your Garmin dealer for service.
REGISTER GFDS	• Data services are inoperative. GFDS is not registered.	• Register with GFDS.
ROL NO COMP	• No data from one or more roll attitude sensors.	• Contact your Garmin dealer for service.
RS-232 CONFIG	• RS-232 configuration error.	• Contact your Garmin dealer for service.
RS-485 CONFIG	• RS-485 configuration error.	• Contact your Garmin dealer for service.
SIMULATOR	• Simulator mode is active. Do not use for navigation.	• Simulator mode is active.

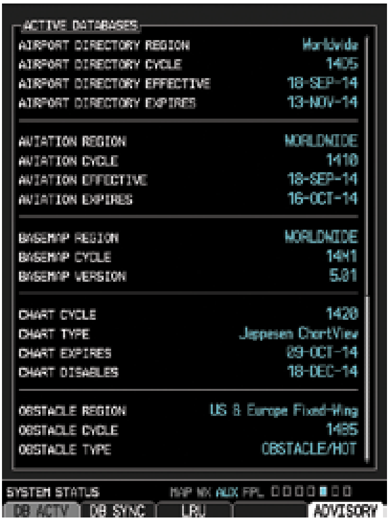
Alert Message	Description	Action
STORMSCOPE	- Stormscope® either reports a failure or has timed-out.	- Contact your Garmin dealer for service.
SVT DISABLED	- Outside of terrain database coverage area. - Terrain database resolution is too low.	- Repeat steps to reactivate SVT with the appropriate PFD soft keys. - Install 9 arc-second database.
SW MISMATCH	- GDU software version mismatch. No GDU crossfill.	- Contact your Garmin dealer for service.
TAWS	- External TAWS not available. Internal TERRAIN-SVT alerting enabled. - External TAWS configuration mismatch.	- Contact your Garmin dealer for service.
TDB	- Airframe does not support Terrain database.	
TERRAIN DSP	- Terrain or obstacle database error in TAWS B or TERRAIN-SVT only.	- Update database.
TRAFFIC CONFIG	- ADS-B traffic data does not match configuration.	- Contact your Garmin dealer for service.
TRAFFIC FAIL	- Traffic device has failed. - Traffic data will no longer be displayed.	- Contact your Garmin dealer for service.

Alert Message	Description	Action
TRAFFIC STDBY	- Traffic is in Standby Mode while airborne.	- Check traffic system controls on the MFD traffic map page or traffic system.
TRK LOST	- Heading and track from active GPS lost. HSI is using secondary GPS track.	
TRK TRAFFIC	- Heading lost. Traffic is now based on track.	
WX ALERT	- Possible severe weather ahead.	- Check weather radar.
WX RADAR	- Communication with Weather Radar lost.	- Contact your Garmin dealer for service.
WX RDR SERVICE	- Weather radar needs service.	- Contact your Garmin dealer for service.
WXR INPUT FAULT	- Weather radar is not receiving one or more inputs.	- Contact your Garmin dealer for service.

Table 6-1 Alert Messages

6.2 System Status

The System Status page of Aux mode shows the status, serial number, and software version of LRUs and the date of databases. There are no menu pages. In the LRU Status column, a green check means the unit is present and operating properly, while a red “X” indicates an absence or failure.

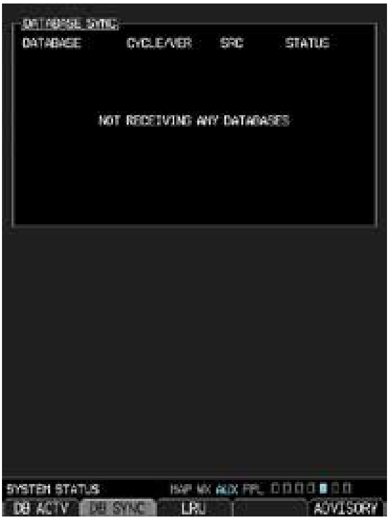


ACTIVE DATABASES

AIRPORT DIRECTORY REGION	Worldwide
AIRPORT DIRECTORY CYCLE	1405
AIRPORT DIRECTORY EFFECTIVE	18-SEP-14
AIRPORT DIRECTORY EXPIRES	13-NOV-14
AVIATION REGION	WORLDWIDE
AVIATION CYCLE	1410
AVIATION EFFECTIVE	18-SEP-14
AVIATION EXPIRES	16-OCT-14
BASEMAP REGION	WORLDWIDE
BASEMAP CYCLE	1401
BASEMAP VERSION	5.01
CHART CYCLE	1420
CHART TYPE	Jeppesen ChartView
CHART EXPIRES	09-OCT-14
CHART DISABLES	18-DEC-14
OBSTACLE REGION	US & Europe Fixed-Wing
OBSTACLE CYCLE	1405
OBSTACLE TYPE	OBSTACLE/HOT

SYSTEM STATUS
MAP WX AUX FPL
DB ACTV
DB SYNC
LRU
ADVISORY

Active Databases



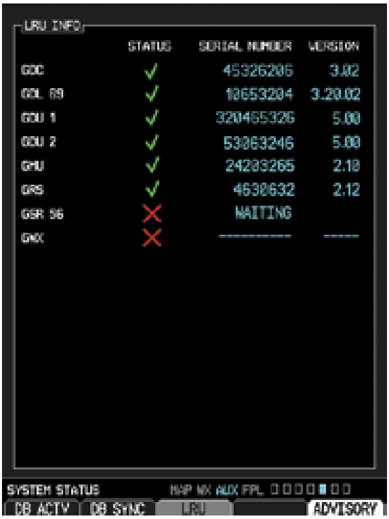
DATABASE SYNC

DATABASE CYCLE/VER SRC STATUS

NOT RECEIVING ANY DATABASES

SYSTEM STATUS
MAP WX AUX FPL
DB ACTV
DB SYNC
LRU
ADVISORY

Database Sync



LRU INFO

	STATUS	SERIAL NUMBER	VERSION
GDC	✓	45326206	3.02
GDL 69	✓	10653204	3.20.02
GDU 1	✓	320465326	5.00
GDU 2	✓	53063246	5.00
GMU	✓	24203265	2.10
GRS	✓	4630632	2.12
GSR 56	✗	WAITING	
GWX	✗	----------	-----

SYSTEM STATUS
MAP WX AUX FPL
DB ACTV
DB SYNC
LRU
ADVISORY

System LRUs

Figure 6-1 System Status Displays

7 SYMBOLS

The following tables describe the symbols that are found on the MFD Map displays.

7.1 Map Page Symbols

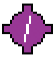
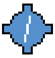
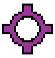
Symbol	Description
	Unknown Airport
	Non-towered, Non-serviced Airport
	Towered, Non-serviced Airport
	Non-towered, Serviced Airport
	Towered, Serviced Airport
	Soft Surface, Serviced Airport
	Soft Surface, Non-serviced Airport
	Private Airport
	Heliport
	Intersection
	LOM (compass locator at outer marker)
	NDB (Non-directional Radio Beacon)
	VOR
	VOR/DME
	ILS/DME or DME-only
	VORTAC
	TACAN

Table 7-1 Map Page Symbols

7.2 SafeTaxi™ Symbols

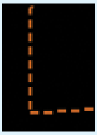
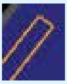
Symbol	Description
Ⓗ	Helipad
☆	Airport Beacon
	Under Construction Zones
	Designated Water Areas

Table 7-2 SafeTaxi Symbols

7.3 Traffic Symbols

Symbol	Description (Highest to Lowest Priority)
●	Traffic Advisory (TA), In Range
◐	Traffic Advisory (TA), Out of Range
◆	Proximate Advisory (PA)
◇	Other Traffic

Table 7-3 Traffic Symbols

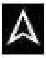
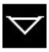
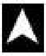
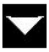
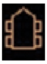
Symbol	Description
	Basic Non-Directional Traffic
	Basic Directional Traffic
	Basic Off-scale Selected Traffic
	Proximate Non-Directional Traffic
	Proximate Directional Traffic
	Proximate Off-scale Selected Traffic
	Non-Directional Alerted Traffic
	Off-Scale Non-Directional Alerted Traffic
	Directional Alerted Traffic
	Off-Scale Directional Alerted Traffic
	Non-Directional Surface Vehicle
	Directional Surface Vehicle

Table 7-4 ADS-B Traffic Symbols

NOTE: *Color of basic and proximate traffic is dependent on airborne/on-ground status of target (target is brown when on the ground, see the surface vehicles).*

7.4 Terrain Obstacle Symbols

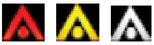
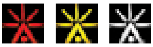
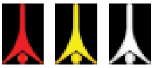
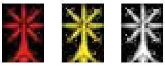
Unlighted Obstacle (Height is less than 1000 ft AGL)	Lighted Obstacle (Height is less than 1000 ft AGL)	Unlighted Obstacle (Height is greater than 1000 ft AGL)	Lighted Obstacle (Height is greater than 1000 ft AGL)
			

Figure 7-1 Obstacle Altitude/Color Correlation

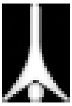
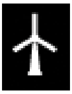
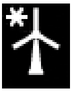
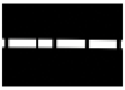
Tower	Windmill	Grouped Obstacles	Power Line
		 The "*" notes grouped obstacles.	

Figure 7-2 Obstacle Icon Types

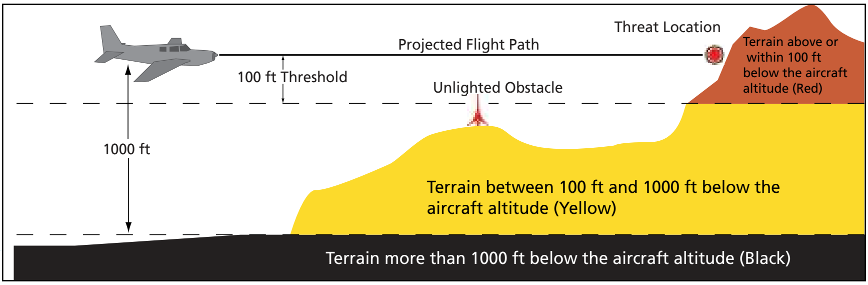

Threat Location
Projected Flight Path
Terrain above or within 100 ft below the aircraft altitude (Red)
100 ft Threshold
Unlighted Obstacle
1000 ft
Terrain between 100 ft and 1000 ft below the aircraft altitude (Yellow)
Terrain more than 1000 ft below the aircraft altitude (Black)

Figure 7-3 TERRAIN Altitude/Color Correlation

7.5 Basemap Symbols

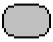
Symbol	Description
	Interstate Highway
	State Highway
	US Highway
	National Highway - 2-digit drawn inside
	Small City or Town
	Medium City
	Large City

Table 7-5 Basemap Symbols

7.6 Map Tool Bar Symbols

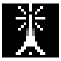
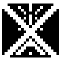
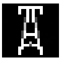
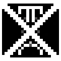
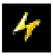
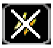
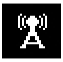
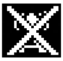
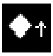
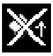
Symbol	Description
	Terrain Proximity Enabled and Available Indicator
	Terrain Proximity Enabled and Not Available Indicator
	Point Obstacle Enabled and Available Indicator (Software version 5.12 and later)
	Point Obstacle Enabled and Not Available Indicator (Software version 5.12 and later)
	Wire Obstacles Enabled and Available Indicator (Software version 5.12 and later)
	Wire Obstacles Enabled and Not Available Indicator (Software version 5.12 and later)
	StormScope
	StormScope Enabled and Not Available Indicator
	Ownship is receiving TIS-B and ADS-R services (Software version 5.11 or earlier)
	Possible incomplete traffic picture – ownship is not receiving one (or both) of the TIS-B or ADS-R services (Software version 5.11 or earlier)
	Traffic Enabled and Available Indicator
	Traffic Enabled and Not Available Indicator

Table 7-6 Map Tool Bar Symbols

7.7 Miscellaneous Symbols

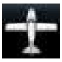
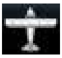
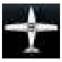
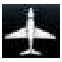
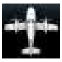
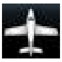
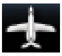
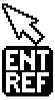
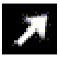
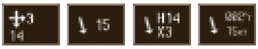
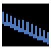
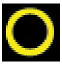
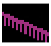
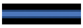
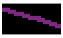
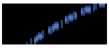
Symbol	Description
	Fixed Wing, Low Wing
	Fixed Wing, High Wing
	Kit Plane
	Turboprop
	Twin-Engine Prop
	Single-Engine Jet
	Business Jet
	Default Map Cursor
	Measuring Cursor
	MFD Wind Vector (w/ valid GPS solution)
	PFD Wind Vector styles
	Parallel Track Waypoint
	Restricted/Prohibited/Warning/Alert
	TFR (Temporary Flight Restrictions)
	MOA
	Class B Airspace
	Class C Airspace
	Class D Airspace
	User Waypoint

Table 7-7 Miscellaneous Symbols

This page intentionally left blank

8 GLOSSARY

ACT, ACTV	active, activate
ADC	Air Data Computer
ADF	Automatic Direction Finder
ADI	Attitude Direction Indicator
ADS-B	Automatic Dependent Surveillance - Broadcast
AFF	Automatic Flight Following
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AGL	Above Ground Level
AHRS	Attitude and Heading Reference System
AIM	Airman's Information Manual
AIRMET	Airman's Meteorological Information
ALT	altitude
AP	autopilot
APR	approach
APT	airport, aerodrome
ARINC	Aeronautical Radio Incorporated
ARSPC	airspace
ARTCC	Air Route Traffic Control Center
AS	airspeed
ASOS	Automated Surface Observing System
ATC	Air Traffic Control
ATCRBS	ATC Radar Beacon System
ATIS	Automatic Terminal Information Service
AUX	auxiliary
AWOS	Automated Weather Observing System
BARO	barometric setting
BC	backcourse
Bearing	The compass direction from the present position to a destination waypoint
BRG	bearing
C	center runway
°C	degrees Celsius
CDI	Course Deviation Indicator
CHNL	channel
CLD	cloud
CLR	clear
CONFIG	configuration

Course	The line between two points to be followed by the aircraft
Crosstrack Error	The distance the aircraft is off a desired course in either direction, left or right
CRS	course
CRSR	cursor
CTA	Control Area
CTRL	control
CUM	The total of all legs in a flight plan.

D ALT	density altitude
DB, DBASE	database
DCLTR, DECLTR	declutter
deg	degree
DEP	departure
Desired Track (DTK)	The desired course between the active “from” and “to” waypoints
DEST	destination
DFLT	default
DIS	distance
Distance	The ‘great circle’ distance from the present position to a destination waypoint
DME	Distance Measuring Equipment
DP	Departure Procedure
DPRT	departure
DSBL	disabled
DTK	Desired Track

EDR	Excessive Descent Rate
ELEV	elevation
EMI	Electromagnetic Interference
ENR	en route
En Route Safe Altitude	The recommended minimum altitude within ten miles left or right of the desired course on an active flight plan or direct-to
ENT	enter
ERR	error
ESA	En route Safe Altitude
ETA	Estimated Time of Arrival
ETE	Estimated Time En Route

ºF	degrees Fahrenheit
FAA	Federal Aviation Administration
FCC	Federal Communication Commission
FCST	forecast
FD	flight director
FIS-B	Flight Information Services-Broadcast
FISDL	Flight Information Service Data Link
FLTA	Forward Looking Terrain Avoidance
FPL	flight plan
FREQ	frequency
FRZ	freezing
FSS	Flight Service Station
ft	foot/feet
G/S, GS	glideslope
GDC	Garmin Air Data Computer
GDL	Garmin Satellite Data Link
GDU	Garmin Display Unit
GEO	geographic
GLS	Global Navigation Satellite Landing System
GMA	Garmin Audio Panel System
GMT	Greenwich Mean Time
GMU	Garmin Magnetometer Unit
GPS	Global Positioning System
GPSS	GPS Roll Steering
Ground Speed	The velocity that the aircraft is travelling relative to a ground position
Ground Track	*see Track*
GRS	Garmin Reference System
GS	Ground Speed
GTX	Garmin Transponder
HDG	heading
Heading	The direction an aircraft is pointed, based upon indications from a magnetic compass or a properly set directional gyro
HFOM	Horizontal Figure of Merit
Hg	mercury
hPa	hectopascal
HPL	Horizontal Protection Level

HSDB	High-Speed Data Bus
HSI	Horizontal Situation Indicator
Hz	Hertz
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IGRF	International Geomagnetic Reference Field
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IOI	Imminent Obstacle Impact
INFO	information
in HG	inches of mercury
INT	intersection(s)
INTEG	integrity (RAIM unavailable)
ITI	Imminent Terrain Impact
L	left, left runway
LAT	latitude
LCD	Liquid Crystal Display
LCL	local
LED	Light Emitting Diode
Leg	The portion of a flight plan between two waypoints
LIFR	Low Instrument Flight Rules
LNAV	Lateral Navigation
LOC	localizer
LOI	loss of integrity (GPS)
LON	longitude
LPV	Localizer Performance with Vertical guidance
LRU	Line Replacement Unit
LT	left
LTNG	lightning
MAG	Magnetic
MAG VAR	Magnetic Variation
MapMX	A proprietary data format used to forward navigation information from the Garmin GPS units to the GDU 620
MAX	maximum

MAXSPD	maximum speed (overspeed)
MDA	barometric minimum descent altitude
METAR	Aviation Routine Weather Report
MFD	Multi Function Display
MIN	minimum
Minimum Safe Altitude	Uses Grid MORAs to determine a safe altitude within ten miles of the aircraft present position
MKR	marker beacon
MOA	Military Operations Area
MOV	movement
mpm	meters per minute
MSA	Minimum Safe Altitude
MSG	message
MSL	Mean Sea Level
MT	meter
mV	millivolt(s)
MVFR	Marginal Visual Flight Rules
NAV	navigation
NAVAID	NAVigation AID
NCR	Negative Climb Rate
NDB	Non-Directional Beacon
NEXRAD	Next Generation Radar
OAT	Outside Air Temperature
OBS	Omni Bearing Selector
PA	Proximity Advisory
PC	personal computer
PDA	Premature Descent Alert
PFD	Primary Flight Display
P. POS	Present Position
PTK	parallel track
QTY	quantity

R	right, right runway
RAIM	Receiver Autonomous Integrity Monitoring
RAM	random access memory
REF	reference
REQ	required
REV	reverse, revision, revise
RMI	Radio Magnetic Indicator
RNG	range
RNWY	runway
ROC	Reduced Required Obstacle Clearance
RT	right
RTC	Reduced Required Terrain Clearance
SBAS	Satellite-Based Augmentation System
SCIT	Storm Cell Identification and Tracking
SD	Secure Digital
SFC	surface
SIAP	Standard Instrument Approach Procedures
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SLP/SKD	slip/skid
SMBL	symbol
SPD	speed
SRVC, SVC	service
STAR	Standard Terminal Arrival Route
STATS	statistics
STBY	standby
STD	standard
SUA	Special Use Airspace
SUSP	suspend
SVT	Synthetic Vision
SW	software
SYS	system
T	true
TA	Traffic Advisory
TACAN	Tactical Air Navigation System
TAF	Terminal Aerodrome Forecast
TAS	True Airspeed
TAS	Traffic Advisory System

TAT	Total Air Temperature
TAWS	Terrain Awareness and Warning System
TCA	Terminal Control Area
TCAS	Traffic Collision Avoidance System
TEMP	temperature
TERM	terminal
TFR	Temporary Flight Restriction
T HDG	True Heading
TIS	Traffic Information System
TMA	Terminal Maneuvering Area
Topo	topographic
Track	Direction of aircraft movement relative to a ground position; also ‘Ground Track’
TRK	track
TRSA	Terminal Radar Service Area
UNAVAIL	unavailable
USR	user
UTC	Coordinated Universal Time
UTM/UPS	Universal Transverse Mercator/ Universal Polar Stereographic Grid
V, Vspeed	velocity (airspeed)
VAR	variation
VFR	Visual Flight Rules
VHF	Very High Frequency
VLOC	VOR/Localizer Receiver
VMC	Visual Meteorological Conditions
VNAV, VNV	vertical navigation
VOR	VHF Omni-directional Range
VORTAC	very high frequency omnidirectional range station and tactical air navigation
VS	Vertical speed
VSI	Vertical Speed Indicator
WAAS	Wide Area Augmentation System
WGS-84	World Geodetic System - 1984
WPT	waypoint(s)
WX	weather

XPDR	transponder
XTK	cross-track

APPENDIX A

SD Card Use and Databases

The G500/600 System uses Secure Digital (SD) cards to load and store various types of data. For basic flight operations, SD cards are required for database storage as well as database updates.

SD cards are required for Terrain, Obstacle, FliteChart, SafeTaxi, and ChartView database storage as well as Jeppesen aviation and ChartView database updates. The Aviation Database update card may be inserted in either SD card slot for database updates and then removed. Other database cards must be located in the lower SD card slot. ChartView is an optional feature that requires enablement by a Garmin dealer.

The unit will generate an error in the event that a database SD card is inserted into the top slot. Aviation databases can be loaded from an SD card in either slot. If the aviation database on the SD card is more than two cycles expired, and the pilot declines the system's prompt to update the aviation database, the system will provide a second prompt that allows the pilot to suppress future prompts to update to that particular aviation database on that SD card.

***NOTE:** Ensure the GDU 620 is powered off before inserting or removing an SD card.*

***NOTE:** Refer to Appendix A for instructions on updating the aviation database.*

Inserting an SD Card

1) Insert the SD card in the SD card slot (the front of the card should be flush with the face of the display bezel).

2) To eject the card, gently press on the SD card to release the spring latch.

Database Name	Function	Where Stored	Update Cycle	Provider	Notes
Aviation	Airport, NAVAID, Waypoint, and Airspace information	Internal GDU 620 memory	28 days (on Thursdays)	fly.garmin.com	Updates installed via SD card and copied into internal memory
IGRF model	AHRS magnetic variation model	Internal GRS 77 memory	5 years	fly.garmin.com	Included with Aviation database
SafeTaxi	Airport surface diagrams	SD card	56 days (on Thursdays)	fly.garmin.com	
Terrain	Topographic map, SVT, Terrain/TAWS	SD card	As required	fly.garmin.com	9 arc-second version required for SVT
Obstacle	Obstacle information for map, SVT, and TAWS	SD card	56 days (on Thursdays)	fly.garmin.com	
Basemap	Boundary and road information	Internal Memory or SD card	As required	fly.garmin.com	
Airport Directory	Airport facility and FBO information	SD card	56 days	fly.garmin.com	Database may be available in different versions. Update cycle and content may vary.
FliteCharts	FAA-published terminal procedures	SD card	28 days (on Thursdays)	fly.garmin.com	Disables 180 days after expiration date.
ChartView	Jeppesen terminal procedures	SD card	14 days (on Fridays)	Contact Jeppesen	Optional feature that requires Garmin dealer enablement. Disables 70 days after expiration date.

Table A-1 Database List

Jeppesen Databases

The aviation database is updated on a 28 day cycle. Aviation database updates are provided by Garmin and may be downloaded from the Garmin web site “fly.garmin.com” onto a Garmin provided Supplemental Datacard. Contact Garmin at fly.garmin.com for aviation database updates and update kits. The Aviation database is stored internally and the Datacard is only used to transfer the database into the unit.

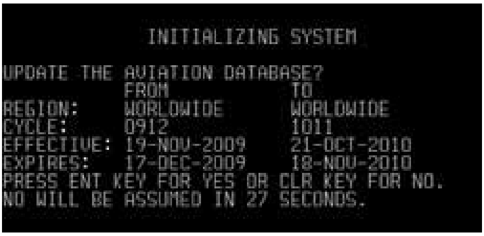
The optional ChartView database is updated on a 14 day cycle. The ChartView database is provided directly from Jeppesen. ChartView is an optional feature that requires enablement by a Garmin dealer. Contact Jeppesen (www.jeppesen.com) for ChartView subscription and update information.

Updating the Jeppesen Database

1) With the G500/600 System OFF, insert the SD card containing the aviation database update into the either card slot of the GDU 620 to be updated (label of SD card should face up).

2) Turn the G500/600 System ON.

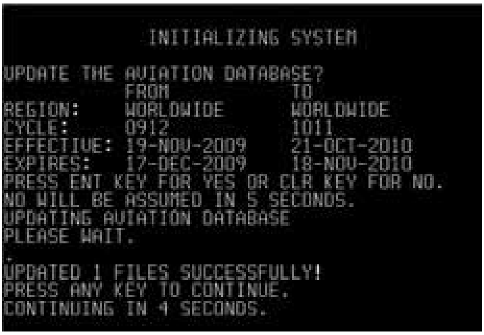
3) Verify the correct update cycle is loaded during power-up. Press the **ENT** key to continue or the **CLR** key to cancel loading.



```
             INITIALIZING SYSTEM
UPDATE THE AVIATION DATABASE?
           FROM               TO
REGION:    WORLDWIDE          WORLDWIDE
CYCLE:     0912               1011
EFFECTIVE: 19-NOV-2009        21-OCT-2010
EXPIRES:   17-DEC-2009        18-NOV-2010
PRESS ENT KEY FOR YES OR CLR KEY FOR NO.
NO WILL BE ASSUMED IN 27 SECONDS.
```

Figure A-1 Database Initialization Display

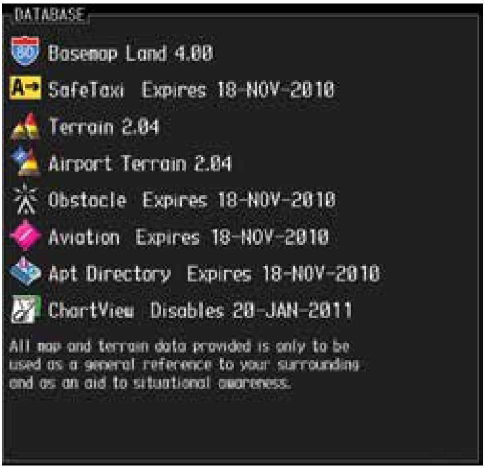
4) A notice on the display will indicate successful updating of the database.



```
              INITIALIZING SYSTEM
UPDATE THE AVIATION DATABASE?
            FROM           TO
REGION:     WORLDWIDE      WORLDWIDE
CYCLE:      0912           1011
EFFECTIVE: 19-NOV-2009     21-OCT-2010
EXPIRES:    17-DEC-2009     18-NOV-2010
PRESS ENT KEY FOR YES OR CLR KEY FOR NO.
NO WILL BE ASSUMED IN 5 SECONDS.
UPDATING AVIATION DATABASE
PLEASE WAIT.
.
UPDATED 1 FILES SUCCESSFULLY!
PRESS ANY KEY TO CONTINUE.
CONTINUING IN 4 SECONDS.
```

Figure A-2 Database Loading Completed

5) The following display will show the databases and their current status.



DATABASE

Basemap Land 4.00

SafeTaxi Expires 18-NOV-2010

Terrain 2.04

Airport Terrain 2.04

Obstacle Expires 18-NOV-2010

Aviation Expires 18-NOV-2010

Apt Directory Expires 18-NOV-2010

ChartView Disables 20-JAN-2011

All map and terrain data provided is only to be used as a general reference to your surrounding and as an aid to situational awareness.

Figure A-3 Database Information on the Splash Screen

6) Use the large **MFD** knob to select the AUX page group and then small **MFD** knob to reach the System Status Page.

7) Press the **DBASE** soft key to place the cursor in the “DATABASE” window.

8) Turn the small **MFD** knob to scroll through the list and check that all databases are current and there are no errors. If a database is highlighted in yellow, it is either expired or the G500/600 can not determine the date.

9) Power down the GDU 620.

Garmin Databases

WARNING: *The data contained in the terrain and obstacle databases comes from government agencies. Garmin accurately processes and cross-validates the data, but cannot guarantee the accuracy and completeness of the data.*

The following GDU 620 databases are stored on Supplemental Data Cards provided by Garmin:

- Terrain – The terrain database contains terrain mapping data. It is updated periodically and has no expiration date.
- Obstacle – The obstacles database contains data for obstacles, such as towers, that pose a potential hazard to aircraft. Obstacles 200 feet and higher are included in the obstacle database. The rotorcraft database includes all reported obstacles regardless of height. It is very important to note that not all obstacles are necessarily charted and therefore may not be contained in the obstacle database. This database is updated on a 56-day cycle. Obstacles will still be shown after the database has expired. Several obstacle database options are available. Obstacle databases created for GTN software version 5.10 or later include all power lines or only HOT lines depending on the type of obstacle database installed. Hazardous Obstacle Transmission (HOT) Lines are those power lines that are co-located with other FAA-identified obstacles. The installed obstacle database type can be verified on the System Status page. Power line data is available for the contiguous United States as well as small parts of Canada and Mexico.
- SafeTaxi – The SafeTaxi database contains detailed airport diagrams for selected airports. These diagrams aid in following ground control instructions by accurately displaying the aircraft position on the map in relation to taxiways, ramps, runways, terminals, and services. This database is updated on a 56-day cycle. SafeTaxi will still be shown after it has expired.
- FliteCharts – The FliteCharts database contains procedure charts for the United States only. This database is updated on a 28-day cycle. If not updated within 180 days of the expiration date, FliteCharts no longer functions.

- Airport Directory (optional) – The airport directory database contains airport facility and FBO information. This database is optional and "N/A" will be displayed in white text on the startup screen if the database is not installed. This database may be available in multiple versions with varying update cycles and/or content.

Since these databases are not stored internally in the GDU 620, a Supplemental Data Card containing identical database versions must be kept in each display unit for dual installations. After subscribing to the desired database product, the database product will need to be downloaded to a Supplemental Data Card. Insert the Supplemental Data Card into the lower card slot shown in Figure A-4. The Supplemental Data Card should not be removed except to update the databases stored on the card. The upper slot is typically used for updating the navigation database and is then normally left open. The Navigation card may be inserted in either slot, but should use the same slot each time.

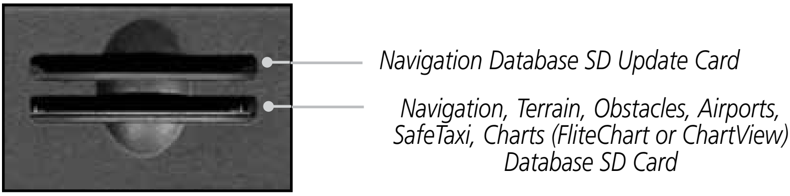

Navigation Database SD Update Card
Navigation, Terrain, Obstacles, Airports, SafeTaxi, Charts (FliteChart or ChartView) Database SD Card

Figure A-4 SD Card Database Location

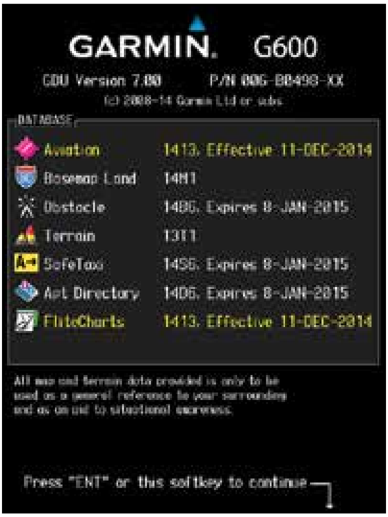
The Garmin databases can be updated by following the instructions detailed in the "Navigation Databases" section of the Garmin web site (*fly.garmin.com*). Once the updated files have been downloaded from the web site, a PC equipped with an appropriate SD card reader is used to unpack and program the new databases onto the existing Supplemental Data Cards. The following equipment is required to perform the update:

- Windows-compatible PC computer (Windows 2000, XP, Vista, or Windows 7 recommended)
- SanDisk SD Card Reader, P/Ns SDDR-93 or SDDR-99 or equivalent card reader
- Updated database obtained from the Garmin web site
- Existing Supplemental Database SD Card (P/N 010-00769-xx)

It may be necessary to have the system configured by a Garmin authorized service facility in order to use certain database features.

Updating Garmin Databases

1) Download the data to the data cards from the appropriate web site.
2) Insert the Database SD card in an empty card slot of the GDU 620. The SD card containing the ChartView, FliteCharts, SafeTaxi, or any other database (except for the Jeppesen Aviation Database) must be inserted into the lower slot on the GDU 620.
3) Apply power to the G500/600 System. View the MFD power-up splash screen. Check that the databases are initialized and displayed on the splash screen. When updating the terrain and FliteCharts databases, an "in progress" message may be seen. If this message is present, wait for the system to finish loading before proceeding. Some databases can take up to 15 minutes to update.
4) Acknowledge the Power-up Page agreement by pressing the **ENT** key or the right-most soft key. If a database is highlighted in yellow, it is either expired or the G500/600 can not determine the date.



GARMIN. G600

GDU Version 7.00 P/N 006-B0498-XX

(c) 2008-14 Garmin Ltd or subs

DATABASE

Aviation	1413, Effective 11-DEC-2014
Basemap Land	14M1
Obstacle	1406, Expires 8-JAN-2015
Terrain	13T1
SafeTaxi	1456, Expires 8-JAN-2015
Apt Directory	1406, Expires 8-JAN-2015
FliteCharts	1413, Effective 11-DEC-2014

All map and terrain data provided is only to be used as a general reference to your surrounding and as an aid to situational awareness.

Press "ENT" or this softkey to continue

Figure A-5 Database Information on the Splash Screen

5) Use the large **MFD** knob to select the AUX page group and then the small **MFD** knob to reach the System Status Page.
6) Press the **DBASE** soft key to place the cursor in the "DATABASE" window.
7) Turn the small **MFD** knob to scroll through the list and check that all databases are current and there are no errors.
8) Power down the GDU 620.

This page intentionally left blank

INDEX

Symbols

1-2 key 2-3

A

Above Ground Level 4-11
ACT 4-110
Activating XM 5-22
Active flight plan 2-15, 3-1, 3-67, 3-68, 3-69
Additional features 5-1
ADF 1-1, 1-2, 2-2, 2-4, 2-28, 8-1
ADIZ 3-6, 3-11, 3-27
ADS-B 4-47
AFF 3-58
Age 4-55
AHRS iii, 1-1, 1-5, 1-6, 1-12, 3-37, 6-2, 6-7, 6-9
Aircraft symbol 2-9, 2-19, 3-3
Air Data Computer 1-1, 1-5
AIREP 4-128, 4-145
AIRMETs 4-56, 4-70, 4-126, 4-142, 4-151
Airport beacon 7-2
Airport diagram 5-3, 5-4, A-5
Airport Directory 3-75, A-6
Airport signs 2-5, 5-42
Airspace labels 3-29
Airspeed Indicator 1-21, 2-5–2-6
Airspeed reference 1-21, 2-8, 3-33
Airspeed tape 2-6, 2-7, 2-18, 3-33
Airspeed trend vector 2-6
Air temperature 1-5, 1-8, 2-1
Airways 3-2, 3-6, 3-11, 3-28
Alerts 2-14, 2-15, 3-69, 4-16, 4-17, 4-19, 4-24, 4-29, 4-40, 4-43, 6-1
Altimeter ii, 2-13, 2-15, 4-4
Altitude 1-1, 1-5, 1-16, 1-21, 2-11, 2-14, 2-15, 3-17, 3-31, 3-37, 3-39, 3-69
Altitude alerter 2-14, 5-15
Altitude alerting 2-14
Altitude Bug 1-16, 2-1, 2-13
Altitude capture 5-32
Altitude Display Mode 4-32, 4-33
Altitude minimums 3-69, 5-15
Altitude select 1-16
Altitude trend vector 2-13
Angle of incidence 4-94
Annunciations 1-12, 2-14, 2-15, 2-30, 4-10, 4-16, 4-17, 4-24, 4-29, 4-35, 4-36, 4-44, 4-46, 5-6, 6-1
Answering a phone call 3-66
Antenna 4-136
Antenna stabilization 4-108
Antenna tilt 4-91, 4-92, 4-96, 4-104, 4-108, 4-112
Approaches 2-24, 2-25, 4-20, 5-3, 5-4, 5-9, 5-13, 5-43, 8-1
Apt Dir 3-75
AP Test 2-3
APTSIGNS 2-5
Arc 4-6, 4-8, 4-13, 4-27
Arrivals 5-3, 5-4
Attitude 1-1, 1-5, 1-6, 1-12, 2-9, 2-11, 5-31, 6-7, 8-1
Attitude and Heading Reference System (AHRS) 1-5, 1-6, 1-12, 6-2
Attitude Indicator 2-9–2-10
Aural message 4-11, 4-15, 4-16, 4-18, 4-22, 4-23, 4-24, 4-30
Automatic flight following 3-58
Autopilot 1-1, 2-3, 5-31
Autopilot disconnect 5-31
Auto-slewing 2-25
Auto zoom 3-11, 3-12
Aux mode 3-31
AUX - System Status Page 5-21
Aviation map data 3-25

B

Backcourse 2-24, 2-25
Backlighting 1-22
Baro-corrected altitude 4-4
Barometric minimum 2-15
Barometric pressure 1-18, 1-22, 2-15, 3-40
Basemap symbols 7-5

Beacon 7-1, 7-2
Bearing information 2-27–2-28
Bearing line 2-28, 4-104, 4-107, 4-108
Bearing Pointers 2-23, 2-27
Best glide 2-8, 3-33
Bezel keys 1-16, 1-18
Blind Alley 4-99
BRG 1-2 2-4
Brightness 1-21, 1-22, 3-31, 3-32

C

Calibrated gain 4-106
Call suppression 3-60
Canadian Nexrad 4-64
Cautions iv, 3-6, 3-40, 4-13, 4-17, 4-30, 4-101, 4-102, 4-112, 5-31
CDI 1-16, 1-21, 2-2, 2-3, 2-19, 2-20, 2-21, 2-22, 2-23, 2-25, 3-31, 3-36, 3-37, 3-67
CDI source 2-22, 2-25, 2-28
Cell movement 3-21, 3-22, 4-56, 4-82
Channel 1-10, 3-42, 5-25, 5-26, 5-27, 5-29
Chart category 3-71, 5-8
Charts 3-77, 5-1, 5-2, 5-4, 5-17
ChartView 5-1, 5-2, 5-3, A-1, A-3, A-7
ChartView database 5-3, 5-4, A-1, A-3
ChartView subscription A-3
Check attitude 5-31
City 3-6, 3-70, 3-73, 4-56, 4-94
City forecast 4-56, 4-77, 4-78
Class B airspace 3-6, 3-26, 7-7
Class C airspace 3-6, 3-26, 7-7
Class D airspace 3-6, 3-27, 7-7
Cloud tops 4-56, 4-67, 4-68
Cloudy 4-57
Cold front 4-77
Color scheme 5-17
Combined NEXRAD 4-142
Compass card 2-19, 2-21
Continental US NEXRAD 4-140
CONUS 4-140
County warnings 4-56, 4-79
Course Deviation Indicator (CDI) 2-19, 2-20, 2-21–2-22
Course pointer 2-19, 2-20, 2-21, 2-25
Course select 1-16, 2-1, 2-23
Crossfill 1-21, 3-36
Cross track error 2-22
Current heading 1-16, 2-19, 2-20, 2-21, 2-24
Current track indicator 2-19, 2-21
Cursor 1-18, 3-7, 3-8, 3-9, 3-10, 3-21, 3-32, 3-34, 3-35, 3-36, 3-73, 3-75, 7-7
Customizing maps 3-10
Customizing Nav Map pages 3-10
Cycle number 5-4, 5-21
Cyclone 4-54, 4-56, 4-85

D

Database 1-5, 1-14, 3-11, 3-43, 4-9, 4-24, 4-73, 4-77, 4-130, 4-147, 5-3, 5-4, 5-21, 6-10, 6-14, A-1, A-5
Databases A-1
Database SYNC 3-44
Data fields 3-68, 3-69
Data link 1-2, 1-10, 4-38, 4-52, 4-55, 4-59, 4-62, 4-66, 4-68, 4-69, 4-71, 4-73, 4-75, 4-76, 4-78, 4-79, 4-82, 4-86, 4-112, 4-121, 4-127, 4-131, 4-133, 4-138, 4-151
Data Link Receiver troubleshooting 5-30
Date 1-21, 3-31, 3-38, 5-4, 5-21, 6-14, A-5
Day view 5-17
DCLTR soft key 3-5, 5-18, 5-19
Decision Height (DH) 3-67
Declutter 2-11, 3-5, 3-6, 4-31, 5-19
Departures 4-20, 5-3, 5-4
Display brightness 1-21, 1-22, 3-31, 3-32
Display units 1-22, 2-34, 3-31, 3-39, 3-40
Distance 1-21, 3-7, 3-9, 3-10, 3-12, 3-13, 3-39, 3-67, 3-70
Distance measuring 3-9
DME 2-30, 7-1
Don’t sink 4-18, 4-23

DP 5-3, 5-4
Dual installation 2-16, 3-36, 3-70, 5-15, A-6

E

Echo tops 4-56, 4-61, 4-65, 4-66, 4-67
ETA 3-67
Excessive descent rate alert 4-18, 4-19
Expiration time 4-52, 4-55, 4-151
Exposure level 4-95
External TAWS 4-25
Extreme attitude 2-11
Extreme Pitch 2-11, 5-45
Extreme Roll 2-12

F

Facility 3-70, 3-72, 3-73
Fast/Slow indication 2-34
Field of view 3-11, 3-19
Five-hundred aural alert 4-18, 4-22
Flight director 5-34
Flight path marker 5-37, 5-41
Flight phase 4-20
Flight plan 1-21, 2-15, 2-24, 3-1, 3-2, 3-12, 3-67, 5-8
FliteCharts 5-3, 5-4, A-5, A-7
FliteCharts database 5-4, A-7
Flood 4-57, 4-79
Fog 4-57, 4-93
Forecast time 4-78
Forward looking terrain avoidance 4-20, 4-26, 4-28
Freezing level 4-56, 4-86, 4-104
Frequency 2-20, 2-24, 2-25, 2-26, 2-27, 3-72, 3-74

G

GAD 43 1-1, 1-2, 2-3, 5-31, 6-6
GDC 74A ii, 1-1, 1-5, 1-8
GDL 69/69A 1-2, 1-10, 3-21, 3-41, 3-42, 4-1, 5-1, 5-22, 5-24, 5-25, 5-30
GDL 69 troubleshooting 5-30
GDL 88 models 1-9
GDU 620 1-1, 1-4
GDU 1040 1-1
GFDS Weather 4-112
Glideslope 2-22, 2-24
Glossary 8-1
GMU 44 1-1, 1-2, 1-8
GPS altitude ii, 4-4
GPS level of service 2-19, 2-21, 2-28
GPSS 5-34
Ground Clutter Suppression 4-110
Ground mapping 4-111, 4-112
Ground pointer 2-1, 2-10
Ground Radar 4-112
Ground return 4-94, 4-96, 4-112
Ground speed 2-5, 2-6, 2-11, 4-24, 5-41
GRS 77 1-1, 1-5, 1-14, 5-31
GSR 56 1-9, 3-56, 3-59
GTP 59 1-2
GTX 33 1-11, 4-1
GTX 330/330D 1-11
GWX 68 4-89

H

Hail 4-61, 4-93, 4-98, 4-100
Hazard avoidance 4-1
Haze 4-57
Heading 1-6, 1-16, 2-19, 2-20, 3-1, 3-37, 4-13, 4-32, 4-38, 5-32
Heading bug 1-16, 2-1, 2-19, 2-20
Heading select 1-16
Helipad 7-2
Heliport 7-1
Home page 3-3
Horizon heading 2-5, 5-37, 5-39, 5-42
Horizon line 2-9
Horizontal scan 4-89, 4-101, 4-104, 4-107, 4-108, 4-109
Horizontal Situation Indicator (HSI) 1-4, 1-16, 2-1, 2-19–2-34, 5-42
Hot spots 5-18, 5-19
Hrzn Hdg 2-5
Hurricanes 4-136

I

Icing 4-70, 4-87, 4-126, 4-127, 4-142, 4-144
Identifier 3-70, 3-71, 3-73, 5-8, 5-9, 5-42
IFR 4-70, 4-127, 4-144
IGRF model 1-5, 1-14
ILS 2-22, 2-24, 2-25, 2-26, 7-1
Imminent obstacle impact 4-20, 4-26
Imminent terrain impact 4-20, 4-26
INFO soft key 3-68
Infra-Red 4-124
Inhibit alerting 4-28
Intersection 3-6, 3-25, 3-26, 5-19, 7-1
Iridium 1-9, 3-56, 3-59, 4-1, 4-112

J

Jeppesen 5-3, A-1, A-3
Jeppesen database A-3, A-7

L

Land data 3-2, 3-11, 3-13, 3-15
Lateral deviation scale 2-19, 2-21
Lat/Lon 3-6, 3-11, 3-18, 3-70
LDA 2-25
Legend 3-11, 3-22, 4-5, 4-16, 4-53, 4-54, 4-58, 4-60, 4-63, 4-67, 4-75, 4-123, 4-132, 4-139, 4-149
Level 1-21, 3-5, 3-6, 3-31, 3-32, 4-17, 4-20, 4-86, 4-98
Lighting 1-22, 3-74
Lightning 3-2, 3-6, 3-21, 3-22, 4-54, 4-56, 4-69, 4-73, 4-116, 4-125, 4-130, 4-147
Limitations 4-9, 4-10, 4-41, 4-61, 4-136
Localizer 2-20, 2-22, 2-25, 2-27
Loc BC 2-25
LPV 2-28
LRU 1-1, 1-3, 1-9, 3-43, 5-30, 6-14
Lubber line 2-19, 2-21

M

Magnetometer 1-2, 1-6, 1-8
Making a phone call 3-65
Map 3-2
Map orientation 3-1, 3-3, 3-12, 3-70, 4-5, 4-13, 4-54, 4-62, 4-116, 4-121, 4-138
Map panning 3-7
Map pointer 3-2, 3-7
Map range 1-21, 3-2, 3-5, 3-12, 4-13, 5-18
Map setup 3-10, 4-28
Map symbols 7-1, 7-5
Map toolbar symbols 7-6
Marker beacon 2-30
Markings 2-7, 5-18, 5-19
Measuring distance 3-9
Menu Key 1-18, 1-19, 3-4, 3-10
Menus 1-18, 1-19
Message 2-19, 4-18, 4-24, 4-30
METARs 3-67, 3-76, 4-54, 4-56, 4-73, 4-116, 4-130, 4-131, 4-147, 4-151
MFD 1-1, 1-4, 1-15, 1-18, 3-1
MFD display units 3-31, 3-39
Military 3-11, 3-27, 4-62
Minimum Descent Altitude (MDA) 2-15
Minimums 5-15
Miscellaneous symbols 7-7
Miscompare 2-31
MOA 3-6, 3-11, 3-27, 7-7
Motion vector 4-50
Mountains 4-136
Moving map 1-1, 1-4, 1-18, 3-1, 3-2, 3-11
MPEL 4-95
MSL 4-4
Mute 5-28

N

National Weather Service 4-59, 4-70, 4-79, 4-126, 4-142
Nav angle 1-22, 2-20, 3-40
Navigation database 1-5, 1-14, A-3, A-6
Navigation map 1-13, 1-18, 3-1, 3-2, 3-10, 4-5, 4-28, 4-52, 5-18, 5-19
Navigation source iii, 2-3, 2-19, 2-22–2-24, 2-27, 2-28, 3-37, 3-67

Nav range ring 3-2, 3-11, 3-13
Nav Status Bar 2-1
Nav status style 2-1, 3-31, 3-35
NDB 3-6, 3-11, 3-25, 3-26, 5-19, 7-1
Negative climb rate 4-18, 4-23
NEXRAD 3-21, 4-56, 4-59, 4-137, 4-138, 4-151
  Legend 4-63, 4-139
  Limitations 4-61
  Viewing range 4-63, 4-138
NEXRAD Legend 3-22
Nexrad source 4-64
NEXRAD Viewing Range 3-22
Night view 5-17
Normal display operation 1-1
North up 3-1, 3-11, 3-12, 4-52, 4-54, 4-116
NOTAM 5-3, 5-16
Notes v
NRST 5-8

O

OAT 1-5, 1-8
OBS 1-16, 2-19, 2-23, 2-28, 3-37, 8-5
Obstacle data 3-17, 4-4, 4-24, A-5
Obstacles 3-13, 3-15, 3-17, 4-4, 4-9, 4-10, 4-11, 4-43, 5-44, 7-4, A-5
Obstructions 4-9, 4-10
Occluded front 4-78
Operating distance 4-95
Other airspace 3-27
Outside air temperature 1-5, 1-8, 2-1
Overspeed 2-6
Overview 1-1

P

Page group 1-18, 3-2
Page menus 1-18, 1-19, 1-20, 3-10, 3-11, 3-21, 3-24, 3-25, 3-32, 3-68, 4-6, 4-14, 4-27, 4-53, 4-54
Panning 3-7, 5-12, 5-19
Parallel track 7-7
Part Sun 4-57
PFD 1-4, 1-15
PFD display units 2-34
PFD options 1-21, 3-31, 3-34, 3-35
PFD soft keys 2-2
Phone book 3-61
Phone call 3-65
Phone volume 3-64
Photocell 1-22
Pilot Controlled Lighting 3-74
PIREP 4-72, 4-128, 4-145
Pitch indication 2-9, 2-11
Pitch scale 2-9, 5-40
Position reporting 3-56
Power 4-137
Power-up 1-5, 1-12, 1-14, 4-11, 4-24, 4-44, 5-4, 5-21, A-3, A-7
Precipitation 4-61, 4-65, 4-73, 4-90, 4-92, 4-93, 4-101, 4-108, 4-122, 4-130, 4-147
Precipitation intensity levels 4-98, 4-105
Premature descent alerting 4-20
Preset 5-29
Product age 4-52, 4-55
Proximate advisory 7-2
Proximity advisory 4-32

R

Radar 4-41, 4-43, 4-59, 4-61, 4-65, 4-89, 4-136, 4-137
Radar altimeter 2-13, 2-17, 2-32, 3-32
Radar gain 4-105
Rainy 4-57
Range keys 1-18, 3-5, 3-70, 5-11
Range ring 3-2, 3-11, 3-13, 4-5, 4-13, 4-32, 4-33, 4-48, 4-109
RECENT 5-8
Record of Revisions vi
Reduced required obstacle clearance 4-20
Reduced required terrain clearance 4-20
Reference speed 2-8
Reflectivity 4-60, 4-61, 4-93, 4-100, 4-137
Regional NEXRAD 4-141
Register with GFDS 4-113
Restore defaults 3-32, 3-69

Restricted airspace 3-27
Roll pointer 2-9
Roll Scale 2-9, 2-10
Roll scale pointer 2-1, 2-10
Roll Scale Zero 2-9
Route 3-8, 3-67, 5-19
Runway depiction 5-43
Runway extension 3-25, 3-26
Runway information 3-72, 3-74

S

SafeTaxi 3-12, 3-25, 5-1, 5-18, 5-19, 5-21, A-1, A-5, A-7
SafeTaxi symbols 7-2
Satellite telephone 3-59
Scale 2-6, 2-8, 2-9, 2-10, 2-13, 2-19, 2-20, 2-21, 3-2, 3-5, 3-7, 3-11, 3-15, 4-3, 4-34, 4-111, 5-40
Scroll bars 5-12
SDF 2-25
Sector scan 4-89, 4-107
Secure Digital (SD) card 2-1, 3-1, A-1
Selected Altitude 2-11, 2-13, 2-14, 2-15, 3-37, 4-132, 4-149
Selected altitude range arc 3-20
Selected Course 2-23, 3-37
Selected Heading 2-20, 3-37
Serial numbers 3-43, 5-30, 6-14
Service Class 5-23, 5-24
SIGMET 4-56, 4-70, 4-71, 4-126, 4-127, 4-142, 4-143, 4-151
Sky pointer 2-10
Sky representation 2-9, 5-45, 5-46
Slewing 2-25
Slip/Skid Indicator 2-1, 2-9
Smart airspace 3-28
Snow 4-57, 4-61, 4-93
Soft keys 1-15, 1-19, 2-1, 2-2, 2-11, 3-1, 4-31, 4-44, 5-26, 5-39, 5-41
Software version 3-43, 5-30, 6-14
Speed 1-5, 1-21, 2-5, 2-8, 2-11, 2-18, 3-13, 3-31, 3-33, 3-39, 4-20, 4-40
Speed range 2-7
STAB 4-108
Stabilization 4-101, 4-108
STAR 5-3, 5-4
Stationary front 4-78
Stormscope 1-9, 4-152
Sunny 4-57
Surface analysis 4-56, 4-77
Surface data 4-54, 4-78
Surface winds 4-70, 4-127, 4-144
Symbols 4-17, 4-34, 4-40, 4-55, 4-57, 5-44, 7-1
Synchronization 1-21, 3-31, 3-36, 3-37
Syn Terr 2-5
Synthetic Vision v, 2-4, 2-5, 3-11, 3-19, 4-26, 4-29, 5-1, 5-37
Synthetic Vision alerts 4-29
Syn Vis 2-4
System description 1-1
System display units 3-31, 3-40
System power 1-5, 1-12, 1-14
System settings 1-20, 3-31
System status 3-43, 4-9, 4-24, 4-35, 4-44, 6-14

T

TACAN 7-1
TAF 3-76, 4-73, 4-130, 4-147
Target selection 4-47
TAS 4-31, 4-101, 5-1
TAWS alerts 4-4, 4-16, 4-17
TAWS-B 4-1, 4-10
TAWS failure alert 4-24
TAWS-SVT 4-1, 4-26
TAWS system test 4-11, 4-14, 4-24
TCA 3-11, 3-26
Temperature 1-22, 3-40, 4-57
Temperature probe 1-1, 1-2, 1-8
Temperature reference 2-29, 3-31
Terrain 1-21, 2-11, 3-1, 3-13, 3-15, 4-1, 4-5, 4-10, 4-26, 4-43, 4-94, 4-111, 7-4, A-1
Terrain alerts 4-23, 4-26, 4-29, 4-30, 5-37
Terrain data 3-11, 3-16, 4-8, 4-9, A-5
Terrain obstacle symbols 4-12, 7-4
Terrain proximity ii, 1-21, 4-1, 4-5, 4-11,

7-6
Terrain scale 4-6
Terrain-SVT iv, 4-2, 4-26
Textual METARs 4-74, 4-131, 4-148
TFR 3-11, 3-25, 3-27, 4-80, 4-134, 4-150, 7-7
Thunderstorm 4-136
Thunderstorms 4-57, 4-79, 4-93, 4-97, 4-98, 4-100
Time 1-21, 3-13, 3-31, 3-38, 4-52, 4-56, 4-77, 4-78, 4-151
Time zone 3-38
TIS 4-31, 4-38, 4-40, 4-41, 4-43, 5-1
TMA 3-11, 3-26
To/From Indicator 2-19, 2-20
Topo data 3-11, 3-15
Topo scale 3-11, 3-15
Tornadoes 4-57, 4-79, 4-100
Tornados 4-136
Track indicator 2-19, 2-21
Track vector 3-2, 3-11, 3-13, 4-42
Traffic Advisory 3-24, 4-1, 4-31, 4-34, 4-38, 7-2
Traffic Pop-Up 4-37
Traffic symbols 4-40, 4-49, 5-44, 7-2
Transponder 1-11, 4-1, 4-31, 4-38, 4-41, 4-43, 4-44
Trend Vector 2-6, 2-13, 2-19, 2-21
True Airspeed 1-21, 2-6, 2-11
True North 2-20, 3-40
Turbulence 4-70, 4-88, 4-90, 4-93, 4-98, 4-126, 4-142
Turbulence Detection 4-110
Turn Rate 2-19
Turn Rate Indicator 2-19, 2-21

U

Unusual attitude 2-11, 5-45

V

VDI 2-24, 5-41
Vector Duration 4-51
Vector motion 4-50
Version 1-12, 3-43, 4-11, 4-26, 5-21, A-6
Vertical deviation 2-24
Vertical scan 4-89, 4-98, 4-99, 4-103, 4-105, 4-107
Vertical speed 1-1, 1-5, 1-17, 1-21, 2-1, 2-11, 2-13, 2-18, 3-31, 3-37, 3-39
Vertical Speed Indicator (VSI) 1-21, 2-18
Video 3-51
VNAV 2-24, 2-28
VNV 8-7
Voice alert 4-43
Volume 1-10, 3-42, 5-25, 5-28
VOR 1-16, 2-3, 2-20, 2-22, 2-27, 3-1, 3-6, 3-11, 3-25, 3-26, 3-37, 4-12, 5-19, 7-1
VORTAC 7-1
Vspeeds 2-8, 3-33

W

WAAS 1-8, 2-24
Warm front 4-77, 4-78
Warnings ii
WATCH 4-92, 4-109
Waypoint information 3-70, 3-72, 3-76, 5-19
Waypoint selection 3-71
Waypoint weather 3-76
Weather 3-21, 3-76, 4-52, 4-112, 4-136
Weather legend 4-53, 4-58, 4-60
Weather mapping 4-97
Weather product 3-22, 4-52, 4-55, 4-58, 4-63, 4-122, 4-138, 5-23
Weather radar 1-2, 4-1, 4-89
Weather symbols 4-55
Wind 1-21, 2-29, 3-2, 3-11, 3-13, 3-31, 3-34, 4-56, 4-57, 4-70, 4-73, 4-75, 4-127, 4-130, 4-132, 4-144, 4-147, 4-149, 4-151, 7-7
Winds aloft 4-56, 4-75, 4-132, 4-149, 4-151
Winds aloft altitude 4-133, 4-149
Wind speed 3-13
Wind vector 1-21, 2-29, 3-11, 3-13, 3-31, 3-34, 7-7
WX-500 1-9, 4-152

WX soft key 3-68

X

XM 3-41, 3-42, 4-52, 5-22
XM channel categories 5-26
XM entertainment radio 5-22
XM radio activation 5-22
XM radio channel presets 5-29
XM radio channels 5-27
XM radio volume 5-28
XM Satellite Radio 1-10, 5-22
XM troubleshooting 5-30
XM weather 3-68, 4-52
XM weather/radio 1-10
XTK 2-22

Z

Zero pitch line 5-41

© 2015 Garmin Corporation

Garmin International, Inc.
1200 East 151st Street, Olathe, Kansas 66062, U.S.A.
Tel. 913/397.8200 or 800/800.1020
Fax 913/397.8282

Garmin AT, Inc.
2345 Turner Rd., S.E., Salem, Oregon 97302, U.S.A.
Tel. 503/581.8101 or 800/525.6726
Fax. 503/364.2138

Garmin (Europe) Ltd.
Liberty House, Bulls Copse Road, Hounsdown Business Park,
Southampton, SO40 9RB, U.K.
Tel. +44 (0) 870 850 1243
Fax +44 (0) 238 052 4004

Garmin Corporation
No. 68, Zhangshu 2nd Road, Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
Tel. 886/2.2642.9199
Fax 886/2.2642.9099

Garmin Singapore Pte. Ltd.
46 East Coast Road
#05-06 Eastgate
Singapore 428766
Tel. (65) 63480378
Fax (65) 63480278

www.garmin.com

Part Number 190-00601-02 Rev. H